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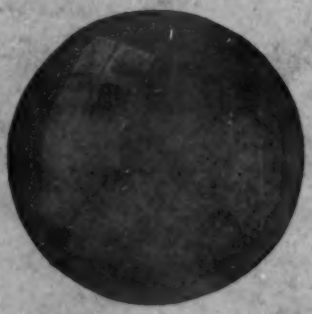

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SWELLING AND OBSCURATION OF OPTIC DISC AND CHANGES OF RETINAL VESSEL IN RAYNAUD'S DISEASE. CASE OF APPLEBAUM AND LERNER. (SEE P. 570)

AMERICAN JOURNAL OF OPHTHALMOLOGY

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RAYNAUD'S DISEASE WITH OCULAR COMPLICATIONS.

S. J. APPELBAUM, M.D., and MACY L. LERNER, M.D., M.Sc. Med.

ROCHESTER, NEW YORK.

In the case here reported attacks of migrain, with visual disturbances, temporary loss of memory and disordered sensations, had preceded the blanching of the fingers and gangrene of one distal phalanx. The ocular fundus showed papilledema, hemorrhages and altered caliber of the retinal vessels. Under treatment these symptoms disappeared.

The etiology of Raynaud's disease is still in obscurity. Many theories attempt to explain this serious affection but none of them seem to be conclusive. There is yet room for investigation of this, fortunately, uncommon malady. The ophthalmologist indeed, finds no less interesting pathologic changes in the fundus oculi than the internist sees in the other parts of the body, and therefore should share in the study of this disease. We feel that the report of a case additional to the many already in the literature is justified.

Our patient is a Jewess, married, age forty-five. Her family history has no particular bearing on her present ailment. Her father died at the age of fifty-one of "dropsy." Her mother, still living at the age of eighty-four, was subject to "rheumatism" in her youth. Insofar as the patient is familar with her family history there was no similar ailment in either her father's or mother's families. She was born in Russia, one of three children, and came to the United States at the age of four.

In her childhood, the patient had measles at about the age of three years, followed by scarlet fever at about the age of four. During her youth she had frequent attacks of bronchitis and from twelve to nineteen had frequent attacks of what was diagnosed as malaria. She then lived in New Jersey. She was married at nineteen. At twenty had appendicitis followed by an appendectomy. She has had two children, both living; the first ten months after marriage, and the second twenty-five months later. Her menstrual periods for the past year have been rather irregular, at times the intervals being unduly prolonged or shortened, and at times the flow being scant or excessive, with symptoms suggestive of the oncoming of the menopause. For about two years preceding the present illness she was under considerable nervous tension as a result of family and financial worries.

She came under the observation of Dr. Appelbaum at the onset of her present illness in June, 1924, with the appearance of red streaks, having all the aspects of subcutaneous hemorrhages, in the tips of all the fingers of the left hand including the thumb. This was associated with a burning, stinging pain. The right hand was not affected. She had been playing golf the day this disturbance came on and attributed it to the tight grip of the left hand on her club. About a week or two later she complained that her fingers would blanch when they came in contact with anything cold.

About a month later she began to have frequent attacks of severe pain in the fourth and fifth fingers of left hand, with pallor and congestion of distal half of fingers. During that period all the fingers of the left hand would blanch, if the hand was immersed in cold water. These attacks came two or three times a week, associated with severe pain and nervous exhaustion. The weather during this period was warm, some days being uncomfortably hot. In September and October she had two attacks of "migrain" associated with temporary loss of memory, numbness and pricking in

fingers, feet and tongue and disturbed vision. An examination of her eyegrounds at that time by a competent oculist showed perfectly normal intraocular structures in both eyes.

In January, 1925, patient was referred to Dr. Lewellys F. Barker of Baltimore for study and observation. The day after her arrival in Baltimore she had a very severe attack of pain associated with blanching in index finger of left hand ultimately ending in dry gangrene of the terminal half of the distal phalanx of that finger. Examination of eyegrounds at that time showed normal discs, normal vessels and no exudates or hemorrhages. She remained in Baltimore about one week and then went to Washington. About a week after arrival in Washington she had another very severe attack. She developed pain in left hand up to shoulder, her hand turned dark up to wrist, she had severe pain in head back of eyes and pain in lobes of ears, cheeks and nose. Her ears and tip of nose showed pallor and cyanosis. These symptoms, with the exception of the pain back of the eyes, disappeared in from 24 to 48 hours. For 48 hours she was unable to retain food. Associated with pain in head back of eyes was extreme sensitiveness to light, being unable to keep eyes open even in a darkened room. She complained of seeing black and red spots. These symptoms gradually eased over a period of about two months during which time she had lost considerable weight and had gone thru marked nervous prostration and physical exhaustion.

Examinations of eyegrounds early in March, when she was able to return to Baltimore showed bilateral choked disc, 4 D., hemorrhages and exudates, with overfilled veins and narrow arteries. A similar observation was made late in March. Examinations made early and in mid April showed edema of discs to be regressing, 2 D., hemorrhages being absorbed, exudates still present, veins overfilled and tortuous with arteries definitely narrowed. Patient's general condition was such that it did not permit of her return home until the latter part of April. Examination of eyegrounds made early in May still showed edema of discs, congestion of veins and narrowing of arteries with hemorrhages and exudates still present. Examination by competent oculist early in June showed vision to be normal with hemorrhages, exudates and swelling of discs to be less than on last examination.

Ophthalmologic studies were conducted by Dr. Lerner at the patient's home; and the following are the findings recorded, July 31, 1925. External ocular examination showed normal conjunctivae, clear cornea. Pupils were slightly unequal, the left one 1/2 mm. smaller. Both reacted to direct and consensual light, and to accommodation. Left pupil seemed to respond to light more promptly. Ocular excursions were full in all directions, and nothing abnormal was detected in the lacrimal apparatus. Tension of each globe was normal to fingers.

Ophthalmoscopy under mydriasis: O. D. media were clear, disc appeared blurry, margins were ill defined and edema of the papilla measured to approximately one diopter. Retinal veins were very tortuous especially at the disc and about 1/2 d.d. away from it. At some places the veins appeared to be bent almost at right angles, in other places they were sacculated, looking engorged and black, interrupted by constricted areas appearing empty of blood. The retinal arteries were very thin and had a bright central reflex. The arteries could hardly be traced at their exit from the nervehead and for a short distance after leaving the disc, on account of their threadlike caliber. The inferior nasal artery was hardly visible. At the time of these ocular studies the patient complained of considerable pain in the globes, radiating to the temples, entire orbit and to the ears. She did not complain of any visual disturbances and no diplopia was present.

She was prescribed sodium salicylate grs. 5 every 3 hrs., aspirin gr. 5 every 4 hrs., dionin ranging in strength from 3 to 5%, gtt. 1 in each eye, t.i.d.

The latter was given merely on a theoretic basis in the hope of influencing the ocular circulation. This treatment, including warm compresses to the eyes with gentle massage of globes, was merely symptomatic.

August 10, 1925. Patient reported that her ocular pain had subsided and that she felt very comfortable. Ophthalmoscopic findings on this date were same as recorded above.

August 30, 1925. Patient reported that she had only an occasional pain in the eyes. She described the pain as of a drawing character. Ophthalmoscopy on this date revealed the following: O. D. media clear, disc fairly well outlined and of good color. Edges of disc made out clearly. No swelling of nerve was noted. Retinal veins were less tortuous, appeared somewhat distended at places and empty in others. Retinal arteries looked extremely narrow, more so at their emergence from the nervehead. They appeared, however, much broader in the periphery. No lesions or hemorrhages were observed on any of the occasions the fundi were studied. O. S. showed a similar picture. Her visual acuity, recorded at a later date at the office, showed 6/9—1 in each eye, not improved by her glasses. She wore a correction of a + .25 sph. ⌒ +. 25 cyl. ax. 180° in each eye and had + 1.25 sph. additional for near.

Physical Examination. The following is a summary of the findings of the physical examination by Dr. Appelbaum, some time before she left for Baltimore: A short brunet, slightly overweight; skin of normal appearance and hair of normal distribution; eyes show nothing abnormal; thyroid not enlarged; teeth in good condition with evidence of considerable dental work; tonsils small with no evidence of infection; glands not enlarged; lungs are resonant thruout, no râles present; heart not enlarged, sounds regular, of good quality, no murmurs present, rate 80 per minute; blood pressure varying at different times from 90/60 to 105/65; abdomen shows old appendectomy scar, otherwise is negative, no masses being felt or tenderness elicited, the hands are small with cold, tapering fingers; reflexes are normal; the urine at different examinations has been normal; the blood picture was normal with exception of a slight degree of anemia; Wassermann was negative; X-ray studies made at Dr. Barker's clinic show nothing of particular significance in the examination of the teeth, sinuses, chest and gastrointestinal tract.

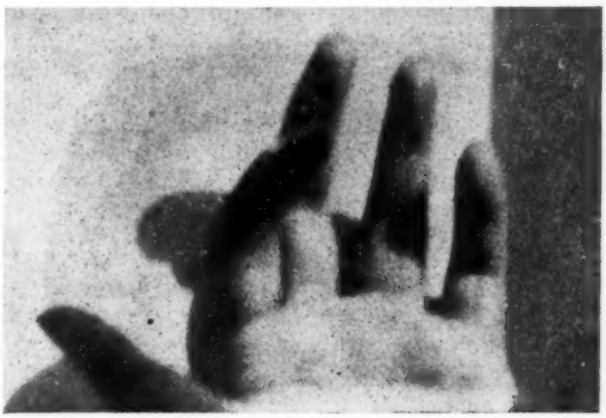

Fig. 1. Raynaud's disease, showing gangrene of left index finger in Appelbaum's and Lerner's case.

Comment. Löhlein's patient was 42 years old. Attacks of migrain were present for 20 years and each attack was associated with obscuration of vision and even transient amaurosis. One eye became sightless following

such attack and the other eye became blind later, following a similar attack. Thrombosis of the retinal veins and arteries was observed in the right eye. In Abadie's patient optic atrophy of each eye was observed following essential and permanent spasm of the retinal artery. Bailliart's patient had many attacks of blindness. The pupils would dilate during these attacks but always react to light. Nerveheads were pale. Retinal arteries were very narrow. His patient was also a sufferer from hypothyroidism. In Clyde E. Shinkle's patient arteriospasm of the left retina was noted. The arteries are described by him as "well shrunken uniformly." Amyl nitrite had a beneficial effect upon them. He noted the effect of the drug with the ophthalmoscope. KI. by mouth and NaI intravenously relieved the ocular pain in his case.

Alterations in the fundus oculi were observed by Raynaud in this affection as far back as 1874. He observed the changes in the caliber of the retinal vessels, alternating or coinciding with the manifestations of local asphyxia in the extremities. Raynaud relates of a man, age 59, who began to suffer from local asphyxia of the fingers during the month of December. The following month the fingers of the other hand were affected, then the feet, and following this the visual disturbances set in. During the attacks of the extremities the eyesight was good, but somewhat later when the fingers were returning to their normal color, the vision diminished. The following is the ophthalmoscopic picture as described by Raynaud: "The central artery of the retina and its branches had very clear contours. They were definitely narrower round the papilla than at the periphery; here and there was a sort of partial constriction. The papilla was very clear. The veins were the seat of remarkable pulsations. The central vein dilated and elongated itself notably, in the region of the papilla, so as to simulate a small aneurism. The pulsation was also visible in the smaller veins." These careful ophthalmoscopic observations made by Raynaud were verified by Galezowski.

Panas observed that at the beginning of the cyanotic attack the arteries of the fundus were definitely narrowed, and that when reaction occurred they became widened.

Raynaud's disease comprehends three clinical groups of cases: local syncope, local asphyxia and symmetric gangrene. All these groups have a temporary but recurrent alteration in the blood supply and consequently nutritive changes in the parts affected. The circulatory and nutritive changes generally affect similar parts on the two sides, altho it may be unilateral. Spasmodic and recurrent contractions of the arterioles supplying the parts produce morbid changes. No primary organic change in the walls or lumen of the blood vessels was observed. It is maintained that the contraction of the arterioles, with partial venous stasis, is due to a reflex act; probably the result of a sensory excitation of the cutaneous nerves and an afferent impulse from the vasomotor center in the cord, determining contraction of the walls of the arterioles. Weiss believes that the ocular phenomena depend on ischemia of the ciliospinal region of the cord. Iridoplegia, ptosis, retraction of the eyeballs, narrowing of the palpebral fissures and contraction of the pupils were observed in Raynaud's disease.

Etiology. Castellino compiled 316 cases of Raynaud's disease in 1895. The following etiologic factors are considered by him:

22 attributed to syphilis
19 attributed to malaria.
16 attributed to alcoholism and arteriosclerosis.
23 attributed to diabetes.
14 attributed to tuberculosis.
9 attributed to pernicious anemia.
8 attributed to leucemia.
8 attributed to nephritis and heart disease.
5 and less to typhoid, pneumonia and rheumatism.
171 cases to neurosis.

It has been suggested by Ward that maniac depressive insanity is a form

of Raynaud's disease, affecting the frontal region of the brain. In all of these the action of cold was the provocative factor. The cold need not be severe, even the change from a warm bed to a cool room may be enough to bring on an attack.

The probability that Raynaud's disease is due to a disorder of the vasomotor nervous system is considered by Dr. Solomon Solis Cohen of Philadelphia. He classifies these vasomotor disturbances into three groups under one name, "ataxia autonomica." (1) One group is characterized by abnormal dilatations of the vessels (angioectasic). (2) The second group is characterized by abnormal constriction of the blood vessels (angiospastic). (3) The third group where a combination of the above two exists is a mixed type where abnormal dilatations and constriction of the blood vessels exist. The last group is the most common one. In Raynaud's disorder we have most likely an angiospastic condition. It is quite probable that an autonomic-sympathetic-endocrine complexus is the basis in the etiology of this affection.

Summary of case. (1). History of great nervous strain and anxiety undergone by patient two years preceding the onset of her present affection.

(2). The history of malaria in her youth lasting from the age of twelve up to the age of nineteen. She was also a sufferer from bronchitis during the same period.

(3). Two attacks of "migrain" just preceding the onset of the disease associated with visual disturbances, temporary loss of memory, numbness and pricking sensations in the fingers and feet.

(4). The development of dry gangrene in the distal phalanx of the left index finger.

(5). Fundus oculi changes characterized by an extreme picture at one time where a bilateral papilledema of 4 D. was present associated with hemorrhages and exudates in the retina.

(6). The gradual subsidence of the edema of nerveheads and absorption of hemorrhages and exudates of the retina.

(7). Lastly the final clearing of the fundi from all the evidence of previous retinal lesions and papilledema, leaving a practically healthy looking disc fairly outlined and only illustrating the typical picture of spasm of retinal vessels existing in this uncommon affection.

332 *Park Avenue.*

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SYMPATHETIC OPHTHALMIA CURED AFTER EXENTERATION OF THE NASAL ACCESSORY SINUSES.

BEN WITT KEY, M.A., M.D.

NEW YORK CITY.

A man got a splinter of steel in his eye, which was removed four days later. After six weeks both eyes were very sensitive to light, and symptoms of uveal inflammation appeared. Later the injured eye was removed. Disease was found in the nasal sinuses and drainage gave great improvement of vision. With relapses of ocular disease, other sinuses were found involved; and treatment each time was followed by improved vision. In the end 20/20 remained. All who examined the case agreed as to the diagnosis, and microscopic examination of the enucleated eyeball showed characteristic lesions of sympathetic ophthalmia. The bearing of such a case on theories of this disease is discussed. The case was presented before the Ophthalmological Section of the New York Academy of Medicine.

Sympathetic ophthalmia has been recently the subject of so much discussion both from the clinical and experimental standpoints, that I would feel some hesitation in adding to it, were it not for the most unusual and clear cut evidence which this case report shows. You may be interested, therefore, in the recitation of a case, which, I believe, is an outstanding instance where sympathetic ophthalmia has been traced to a focus of infection, which either directly or indirectly or in association with the offending injured eye is believed to be the principal, if not the only cause.

Briefly the history and subsequent course of the case is as follows:

The patient is a man, 48 years of age, and a mechanic by trade. On May 26th, 1925, while chiseling on an automobile a small piece of metal flew into his right eye. He continued his work for several hours without complaint. On the following day, because of the irritation of the eye, he was referred to an oculist, who shortly made an unsuccessful attempt to remove the foreign body by magnet application. An X-ray located the metal splinter in the globe. Four days later the steel was removed by magnet extraction. Two weeks later another operation was performed, the purpose and character of which the patient did not understand, nor have I been able to determine. He was discharged from the hospital on July 4th, (about six weeks after the injury) both eyes being very sensitive to light, especially the right, but the vision of both eyes normal.

On July 15th, 1925 (11 days after his discharge), he was referred to my office, at which time I was out of the City, and the oculist whom I had left in charge there, made a careful examination of his eyes. Briefly, the record shows that the injured eye (right) was very sensitive to light, with active conjunctival and iritic reaction; the globe penetrated at the temporal limbus and the iris prolapsed; the cornea was slightly hazy with a few spots on Descemet's membrane; the iris was congested and sluggish in reaction; but with all these changes vision = 20/20— four letters. The left eye was very sensitive to light but only mildly injected; the cornea clear except for a few deposits on Descemet's membrane; the iris was very slightly congested and partly dilated; the pupil large, round and regular, and evidently sluggish from the effect of atropin; the pupillary space was clear and reflected a clear and transparent lens. In spite of these changes the vision of the eye was 20/20.

The patient was sent to the New York Eye and Ear Infirmary at once, where the usual intensive treatment in these cases was administered—hot bathing and atropin, catharsis, mercurial inunctions, large doses of sodium salicylate and later foreign protein injections of antidiphtheritic serum. A complete laboratory examination proved to be negative. As was wise and proper, such a critical condition of both eyes called for a number of consultations. And as is frequently the outcome of several consultations there was wide difference of opinion. The situation was made more acute and uncertain when the opinions rendered were about equally divided for and against enucleation. This of course arose because of the persistent integrity of the

injured globe (vision still being 20/20—) and the constant hope that it might not be necessary to sacrifice the injured eye since it might prove to be after all the better eye of the two. For these reasons enucleation was deferred for about four weeks, but meanwhile both eyes were gradually becoming more actively involved, and the injured eye taking on the characteristic low grade but definitely acute uveitis, later hypertension, and finally detachment of the retina and complete loss of vision. The sympathising left eye at the same time showed the classical low grade plastic uveitis of sympathetic ophthalmia so typical clinically of the disease,—the iris discolored and thickened, the pupillary space partly filled with thin exudate, the vitreous very cloudy, the tension very soft, and the vision reduced to 5/200.

I returned from a rather extended vacation two days after removal of the injured eye, when I first became acquainted with the case and the history of it.

My first impulse was to accept the usual inevitable result of sympathetic ophthalmia—total blindness in this case. But I felt urged to study the history and laboratory reports and to render whatever aid I could—at least for my own satisfaction. I, therefore, increased the protein injections, but without any apparent effect. Further laboratory reports were negative. Altho a previous rhinologic examination had been made, I insisted upon further investigation of the nasal sinuses. Accordingly, an X-ray examination of the sinuses was requested, and Dr. George Dixon reported the following: "Frontals well developed; left ethmoids cloudy; left antrum occluded; left side of nose almost occluded. Nasal septum deflected to the left. Right sphenoid and antrum fairly clear." On the following day the right antrum was punctured and the ethmoids were opened and drained. Both were found to be full of pus—the culture of which showed the pneumococcus capsulatus mucosa. In forty-eight to sixty hours after removal of this purulent material, the vision of the eye improved to 20/200; the vision was distinctly more quiet and the media less hazy.

This improvement remained for a period of only about five days, when there was a gradual return of the eye to its previous condition, and vision = 3/200. Again the sinuses were explored, but more thoroly,—the ethmoids were found to be extensively involved and were partially exenterated, free drainage being established. In forty-eight hours the eye was definitely improved and vision = 20/200, and in forty-eight hours more the vision was 20/70 with gradual daily improvement in the appearance of the eye over a period of about a week. But, now for the third time it could be observed that the eye was again losing ground, the media becoming daily more "muddy," the iris "glued down," thickened, and somewhat granulomatous, and in the course of a few days the vision was again reduced, now to 5/200.

For the third time the sinuses were explored, both sphenoids as well as the ethmoids being found to be filled with pus. Following this apparently complete and extensive operation—performed by Dr. Stewart Craig,—the eye again responded, and in two days the vision was 20/200. In the course of ten days more the eye had lost most of its injection, the aqueous, pupillary space and vitreous rapidly cleared, the fundus for the first time could be indistinctly made out and vision = 20/30—. In a few more days the eye was almost entirely quiet, very slight iritic reaction, the iris becoming less thickened, more defined in structure and with some resemblance of normal color, vision = 20/20—2. To say the least, it was an unexpected but a remarkable transformation.

But the story of this case does not end there. On October 2nd, 1925—about three weeks after the last intranasal operation,—he complained of excruciating pain in the left ear, and on the following day the house-surgeon opened the drum and made a culture of the purulent discharge. The labora-

tory reported the pneumococcus capsulatus mucosa. The urinalysis showed a specific gravity of 1025, acid reaction, sugar +, acetone and diacetic acid none, moderate number of granular casts, few white blood cells. Blood cultures at 24, 48, and 72 hours were negative. An X-ray by Dr. Dixon showed a very cloudy well developed mastoid. His temperature chart was characteristic, and mastoidectomy was advised, after ten days of close study and observation by the otologists. During this acute mastoid development the eye began to show the effects of this renewed toxemia, and the vision became gradually reduced to 20/50, with corresponding uveal reaction. On opening the mastoid (Dr. J. Coleman), free pus came forth from beneath the cortex of a large mastoid sinus; there was softening along the posterior canal wall near the tip, cavitation being ½ inch in diameter below the sinus; the dura and sinus were exposed. On the following day there was a well marked left facial paralysis. No other postoperative complications developed, however, and he has made an uneventful recovery; the facial paralysis has improved slightly.

The eye has rapidly become entirely quiet; and now there is no reflex irritation whatever; the cornea, aqueous, and lens are quite clear; the iris has resumed some of its normal color, but remains discolored and "washed out" in appearance, is pale and atrophic thruout, with numerous synechia from which small splashes of organized exudate cling, radially from the pupillary margin, to the lens capsule. Under the slitlamp these changes are clearly defined; there is also marked bedewing of the posterior corneal surface and a few small spots or collections of exudate (Descemet's spots) are present. The aqueous beam is accentuated (increased relucency of the aqueous), and a moderate number of fine particles (some pigment) are observed in the aqueous stream; there is evidence also of pigment derangement—on the posterior surface of the cornea, in the aqueous, in the iris crypts, and on the lens capsule. The pupil is irregular in outline, remains partly dilated, slightly displaced downward and nasalward, and responds feebly to direct light. The ophthalmoscope reveals a few small floating particles in the vitreous, but the fundus in appearance is normal (no pigment spots, no exudative areas, no visible destructive changes). Normal intraocular tension has been restored; and the vision with correction is 20/20.

Recently, the enucleated eyeball was sectioned, and a microscopic examination of serial sections was made. The following excellent notes from Dr. Bernard Samuel's careful study of these sections confirms pathologically the clinical diagnosis of sympathetic disease.

Macroscopy. (*Specimen No. 4702*). The cornea is completely collapsed. Elsewhere the fibrous tunic is greatly shrunken and distorted. None of the sections available for examination pass thru the injured side. All sections show an extensive detachment of the choroid and of the retina. The perichoroidal and subretinal spaces are occupied by a clear, albuminous fluid.

Microscopy. Cornea. A few wandering cells are encountered in the epithelium and in the stroma. The superficial vessels of the limbus are engorged and are commencing to spread, pannus like, over the cornea. Some deep vessels have penetrated the stroma. Scanty deposits of disintegrating cells and pigment granules are seen on the endothelium of Descemet's membrane.

Sclera. The lamina fusca is uniformly infiltrated with lymphocytes and plasma cells. The emissaria are packed with these cells, Fig. II. A few of them are noticed in the intervaginal space of the optic nerve. The canal of Schlemm is patulous, being filled with erythrocytes.

Choroid. This is everywhere markedly distended. In places the distention is all the more pronounced, because of nodular infiltrations in the vascular layer, Fig. IV. Frequently these nodules coalesce, creating long stretches of uniform infiltration. The nodules are composed mainly of small, intense-

ly staining lymphocytes. In the midst of these dark areas of infiltration, lightly stained patches occur. They are made up of large, elongated cells (epithelioid), with oval, vesicle like nuclei, the cytoplasm taking the eosin stain. Here and there the epithelioid cells conflue, forming giant cells, the nuclei of which are arranged either annularly or irregularly, Fig. V. a. b. c. The walls of the veins are at many points entirely destroyed, Fig. III. The capillary layer is not involved in the infiltration, so that it appears as a narrow, bright streak, pinkish at times on account of the red blood cells, Figs. III and IV. The pigment epithelium overlying the choroid is swollen thruout its extent. At points it has proliferated a little, causing low elevations

Fig. 1. Infiltration of the perichoroidal lamellae, eosinophiles being especially numerous near the ora serrata.

Fig. 2. Infiltration of the choroid and of the lamina fusca and emissaries of the sclera, with sympathetic granulation tissue.

along the surface. In the perichoroidal space numerous cells are released in the fluid, or stick to the lamellae.

Retina. Only two small areas show infiltration. One is at the nervehead, where a few lymphocytes and plasma cells have traveled from the choroid to the neighboring nerve bundles and layers of the retina. Anteriorly, in the area of Blessig's cysts, which are well developed, a mass of cells passes directly from the choroid into the retina.

Ciliary Body. In the flat portion, at the ora serrata, there is a dense aggre-

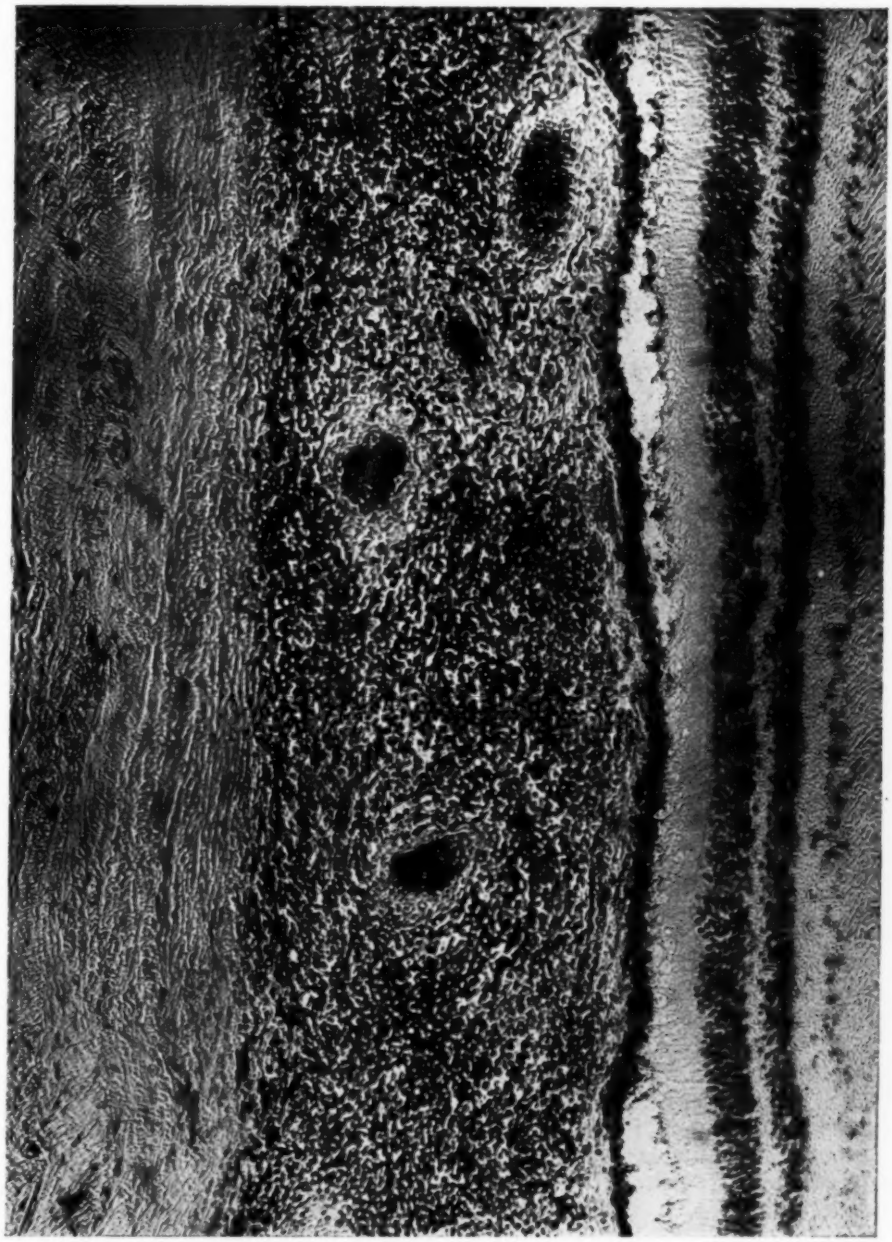


Fig. 3. a. Retina, pigment epithelium and capillary layer without infiltration.
b. Walls of bloodvessels swollen and breaking down—one of them completely broken down.

gation of lymphocytes and plasma cells, containing nests of epithelioid cells and some giant cells, Fig. I. In all the rest of the infiltration of the ciliary body, only lymphocytes, plasma cells, and polymorphonuclear eosinophilic leucocytes are found. On the inner surface, the epithelial layers are intact, except for a short distance in the orbicular space, where their place is taken by fibroblasts.

Iris. The stroma is very edematous, the root being pressed against the pectinate ligament. There is a diffuse infiltration of lymphocytes, plasma cells and eosinophiles. Immediately surrounding the blood vessels, the infiltration is much denser, Fig. III. The anterior limiting layer is sharply defined on the chamber side, on which a scanty number of distended cells and pigment granules are scattered. Posteriorly, the pigment epithelium is swollen. At points, large coal black cells have migrated forward into the stroma. On one side, near the ciliary body, a large, compact accumulation of lymphocytes has broken thru the stroma and destroyed the underlying pigment layer, Fig. I. The pupillary area is bound down to the lens capsule, by a thin exudate.

Anterior Chamber. Wherever the chamber is preserved a few cells and pigment granules are noted. The meshes of the ligamentum pectinatum are crowded with lymphocytes, plasma cells, and eosinophiles.

Posterior Chamber. A delicate cyclitic membrane makes its way from the orbicular space along the zonular fibers and the anterior limiting layer of the vitreous, to the ligamentum hyaloideo-capsulare. Here the membrane fades off into a stratum of disintegrating cells, which passes behind the lens. A few cells and dark granules are caught in the zonular fibers.

Vitreous. The anterior limiting layer holds many cells along its fibrillae. To a less extent cells have wandered into the body of the vitreous. There is no evidence anywhere of a circumscribed accumulation of cells (abscess of the vitreous).

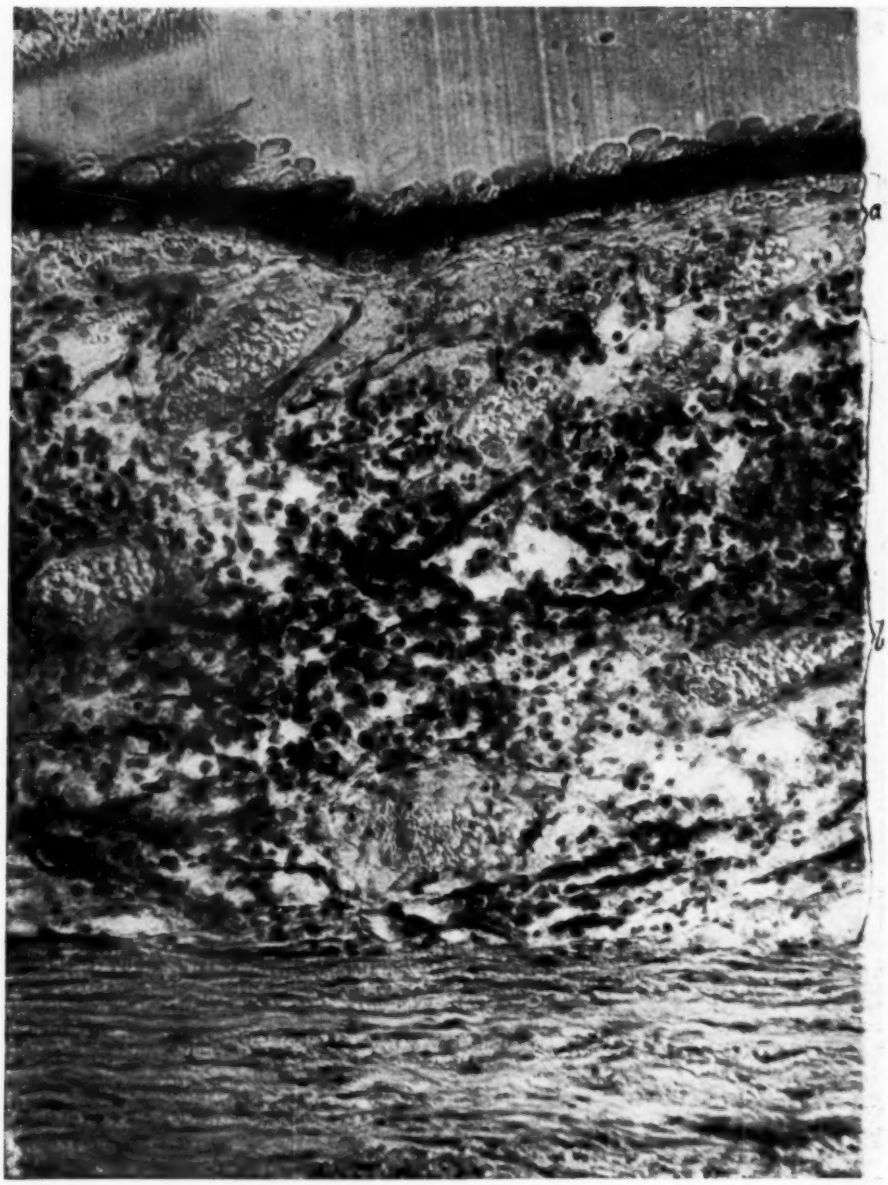
Lens. The alterations observed are referable to the fixation and hardening.

In conclusion, the microscopic picture shows only the typical changes recognized as occurring in cases of true sympathetic ophthalmia. No other pathologic changes in the sections could be found that might confuse one in making this diagnosis.

In commenting upon the important features of this case and their relation to the cause and course of sympathetic disease, may I submit the following questions.

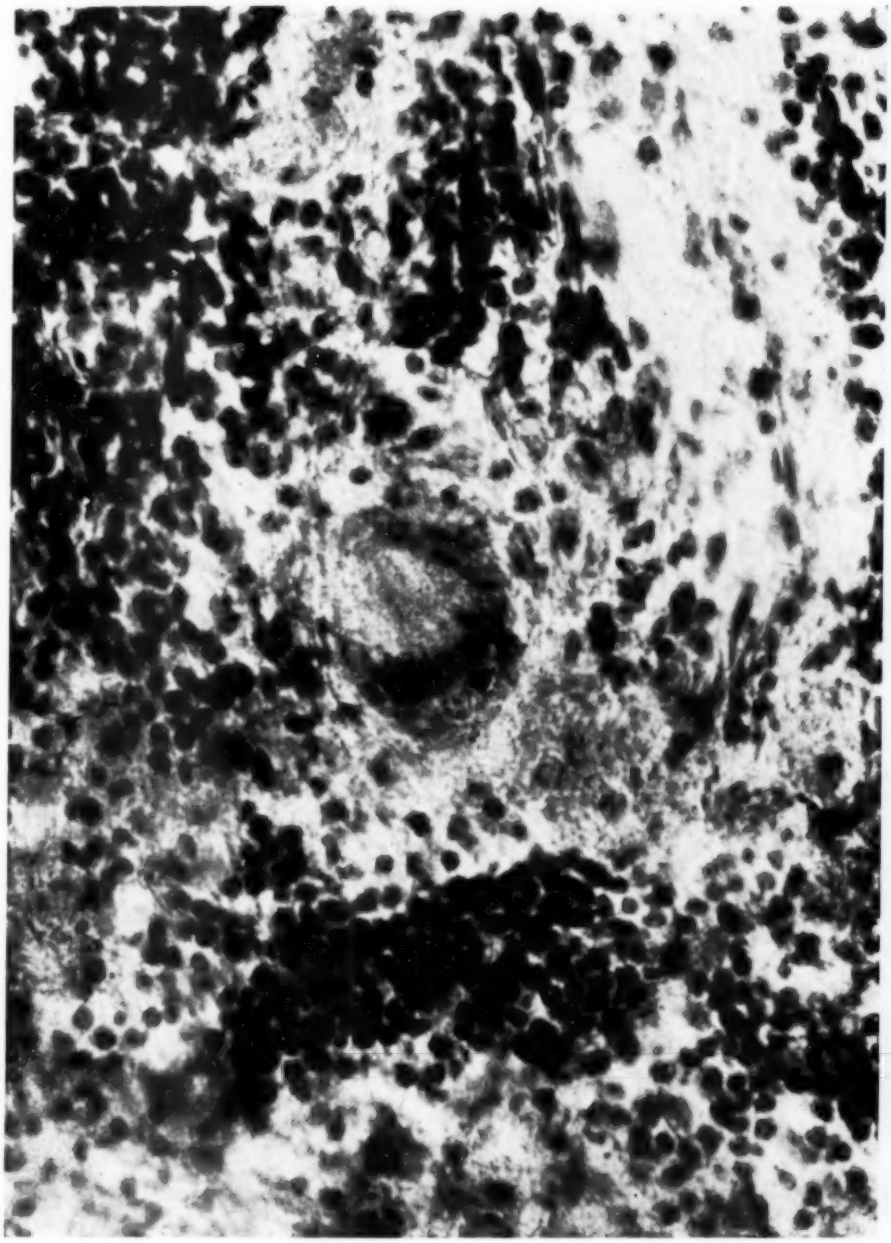
1st. Is there any doubt that we have here a true case of sympathetic ophthalmia? I believe this is made reasonably certain clinically by the opinion of those who saw the case, namely, Dr. Robert G. Reese, Dr. John E. Weeks, Dr. Walter E. Lambert, Dr. Clyde E. McDannald, Dr. Francis W. Shine, and Dr. Samuel P. Oast. There was no doubt in the minds of any of them. That peculiarly low grade plastic folding in and slightly "muddy" appearance of the iris, so characteristic of the disease, was recognized by those who saw and studied the case. Moreover, the microscopic examination of the enucleated eye seems to make the diagnosis certain.

2nd. Can we doubt that this sympathetic ophthalmia then was due to no cause other than the pansinusitis? Do you think it reasonable, that by mere coincidence a recrudescence in this sympathetic process could take place four times, each time followed by exploration of the infected sinuses, with final cure of such an eye having at one time vision of fingers at three feet? To ask this question seems unnecessary. Medicinal treatment had failed over a period of one month, during the steady march of the disease, from almost normal vision in each eye to the complete destruction of the injured eye, the sympathizing eye being reduced to a visual acuity of 5/200. The rapidity with which the eye improved forty-eight to sixty hours after exenteration of the sinuses is significant, because the very marked change in the appearance of the eye justified some improvement in visual acuity. Altho the possibility of a



SYMPATHETIC OPHTHALMIA. (KEY'S CASE.)

FIG. 4. A. CHORIO-CAPILLARIS STANDING OUT AS A LIGHT STRIPE. SHOWING NO INFILTRATION.
B. INFILTRATION IN THE VASCULAR LAYERS OF THE CHOROID.



SYMPATHETIC OPHTHALMIA. (KEY'S CASE.)

FIG. 5. LYMPHOCYTES, EPITHELIOID CELLS AND GIANT CELLS FROM DIFFERENT AREAS OF THE CHOROID AND CILIARY BODY.

retrobulbar neuritis as contributing to the loss and rapid return of vision can not be ruled out, it does not alter the fact that the clinical picture of the uveitis was sufficient to account for the great reduction of vision. In fact, when restoration of vision to 20/200 was first elicited, there was some doubt as to the truth of it, so cloudy was the anterior segment, and so massive was the exudate in the vitreous.

3rd. And, finally, these two premises being accepted, shall we draw the conclusion that sympathetic ophthalmia after all is a specific type of uveitis due to a focus of infection? Of course we may theorize on this question to the extreme. What we need is more evidence.

I believe, however, we are justified in stating at this time; that it seems reasonable to assume that true sympathetic ophthalmia may have its origin in, or is excited by a focus of infection; which, by its toxins, or bacteria in the circulation, affects the injured eye in such a manner as to aid in similarly causing like changes in the fellow eye directly and in association with it. By "association with it" I refer to the allergic state attributed to uveal pigment hypersensitivity occurring as the result of injury or other destructive changes in the uvea of the sympathogenic eye, so ably and thoroly worked out by Allan Woods. The anaphylactic nature of the disease was first brought forward in 1910 by Elschnig, who was able to show by his researches that the pigment of the uveal tract had organ specific properties, and was capable of acting as a foreign protein in the same animal. On the other hand numerous authors have published reports to show the probable etiologic relation of foci of infection to sympathetic disease—principal among these being Elschnig, J. Meller, Harbridge, Stark, Verhoeff, E. V. L. Brown, Vail, Wiener, Arnold Knapp, Guillery, Woodruff and many others.

Furthermore, the absolute identity of the anatomic picture in the sympathogenic and sympathizing eyes can be explained only on the theory that the same specific agent attacks both eyes. Fuchs believes that the pathologic agent reaches the second eye thru the circulation, because the optic nerves and ciliary nerves show no signs of transmission, while the manner in which the leucocytes invade the walls of the vessels of the ciliary body and choroid of the sympathogenic eye indicates the probability of a metastasis, exactly as this occurs in tumors. These facts of course lend weight to a logical bacterial theory.

One is also reminded that pigment absorption from an injured eye, causing hypersensitiveness to pigment, represents an allergic state of hypersusceptibility. And Doer subdivides allergy into two main classes; on the one hand, altered reaction capacity to substances not antigenic in nature (hypersusceptibility to nonantigenic substances), and on the other hand, a similar condition of the body toward substances that are recognized as true antigens (hypersusceptibility to antigenic substances, i.e. substances toxic in themselves as well as protein antigens not primarily toxic). These conclusions, so clearly described by Zinsser, may reasonably be applied to sympathetic disease, in which both eyes are rendered thru pigment absorption hypersusceptible to an intercurrent focus of infection. Furthermore, that pigment absorption is probably an important factor in the etiology of sympathetic uveitis is borne out by the history and course of the disease, by the clinical picture of the "washed out" (pigment absorbed) iris structure, and by the histologic changes in the choroid and ciliary region.

Given, then, an injured eye, or one similarly affected by intraocular tumor, in which the pathologic changes in the uvea are such as to cause thru absorption a hypersensitiveness to pigment in both eyes, to the point perhaps of anaphylactic intoxication (of Elschnig), and then the presence of a focus of infection, exogenous or endogenous, either dormant or relatively active in the body—as tuberculosis (Stark, Meller, Guillery), or syphilis (Vail, Ellett and others), or

that due to the pneumococcus capsulatus mucosa (this case report), actinomycosis (Verhoeff, Fuchs), the staphylococcus or streptococcus (Wiener and others), etc.—does not this combination of circumstances, in the light of numerous detailed clinical reports, argue in favor of the germ theory of excitation, thru the circulation of an active, shall we say, specific (because the microorganisms may have or acquire affinity for the ocular tissues involved, Verhoeff) sympathetic uveitis affecting both eyes? It seems very probable, therefore, that it is the state of anaphylactic intoxication thru pigment absorption which accounts for the characteristic clinical picture of true sympathetic ophthalmia, for it is well known that the clinical picture of uveitis from a focus of infection, but *without* uveal pigment hypersensitivity, is dissimilar.

This combined theory, then, of anaphylaxis and infection seems to explain the clinical picture, the physical state of these patients, as well as the varying course of different cases. All are alike as to the allergic state, altho they may differ in the degree of hypersensitivity. They vary in course and treatment and results because the exciting cause varies. This explains the endogenous as well as the exogenous origin of the disease. It explains those cases which occur after removal of the injured eye, also those cured after removal of the injured eye. It accounts for recurrent attacks, and periods of recrudescence during the course of the disease. It explains those cases apparently due to sarcoma of the sympathogenic eyes (Tooker and Lamb, J. Meller, Boehm); on the other hand, it accounts for the almost constant absence of the disease in cases of penetration of the cornea with iris incarceration, old extensive leucoma adherens, and other destructive changes of the anterior segment from ulceration and infection, etc., where the socalled "danger zone" of the eye is not directly injured (therefore little or no pigment absorption).

Those cases which develop rapidly with a fulminating course, and on the other hand those indescribably slow almost unchanging types lasting over long periods of time and with frequent relapses, are also thus explained, by the different foci of infection to which the hypersusceptible eye may be exposed. It explains the varying results of different forms of treatment, the few spontaneous cures, as well as the uncertain but frequent persistent integrity of the first eye, after destruction of the second eye. It accounts for the frequency of changes in the blood picture, especially the occasional anemia, also the variable leucocytosis, with increase in the mononuclears in some cases, believed to be at one time of prognostic and perhaps of diagnostic value (Gradle, Campbell).

In conclusion: 1. The most important feature of this case report is the certainty that we have here a case of true sympathetic ophthalmia, such as it is known to be clinically and histologically. This is substantiated by the following facts: First, it is secondary to pathologic changes in the eye following trauma. Second, a period of almost seven weeks elapsed after the injury (May 26th to July 15th) when uveitis was found to be present in both eyes—more advanced in the injured eye. Third, the clinical picture was characteristic and was recognized as such by those who saw and followed the case. Fourth, there was the usual tendency for the disease to improve and relapse, with a gradual increase in the pathologic changes—even *after* enucleation of the injured eye. And fifth, the histologic changes as demonstrated in the photomicrographs of the sections of the enucleated eye are those characteristic only of sympathetic ophthalmia. Then if sympathetic ophthalmia (socalled) was present in the *injured* eye, the same pathologic changes must have been present in the sympathizing eye, because the same typical clinical picture of uveitis developed about the same time in both eyes. Obviously the pathologic changes in the second eye were not so advanced as those in the injured eye, otherwise recovery could not have been possible;

but these changes nevertheless, were advanced to the degree that vision = 5/200.

2. This uveitis of both eyes was due to a focus of infection located in the nasal accessory sinuses—pneumococcus capsulatus mucosa.

3. It seems reasonable to assume that sympathetic ophthalmia is a specific type of uveitis due to a focus of infection (or systemic disease) either exogenous or endogenous, just as other types of uveitis have their origin. But the *clinical picture* and the *destructive nature* of the sympathetic type are due to the *pigment* hypersensitiveness and hypersusceptibility of both eyes, incident to uveal destructive changes from injury to the globe.

4. The therapeutic indication, therefore, is the search for and elimination of the focus of infection. Obviously this indication should prove to be of great importance in cases of threatening sympathetic uveitis, where the patient refuses enucleation or where the injured eye itself possibly may survive.

I wish to express my thanks to Dr. Bernard Samuels for his careful study of and report on the histologic specimens of the enucleated eye. Also I am indebted to Mr. Edgar Burchell of the Eno Laboratory, New York Eye and Ear Infirmary, for his interest and care in the preparation of these sections.

This case was presented in person before the Ophthalmic Section of the New York Academy of Medicine, December 21st, 1925.

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SYMPATHETIC UVEITIS INVOLVING ONE EYE.

E. H. HIGBEE, M.D., F.A.C.S.

ST. LOUIS, MO.

This is the report of a case which, from its histopathology, would be classed as sympathetic uveitis, but occurring without history of previous trauma to the fellow eye. Theories of sympathetic ophthalmia are referred to and the histopathology, as observed by Dr. H. D. Lamb and Professor Fuchs of Vienna is described. Read before the St. Louis Ophthalmic Society, January 23, 1925. See p. 544.

In sympathetic uveitis due to injury of the fellow eye, many theories have been advanced, and in seeking an explanation of how sympathetic uveitis can develop from a focal infection it is only natural to consider the theories of investigators.

That a disease, similar in symptoms and pathology to sympathetic uveitis, may develop in any eye that is injured, or possibly inflamed due to disease; and, that focal infection and absorption is the contributory cause must be given consideration. The anaphylactic theory of the etiology of sympathetic ophthalmia, as described by Woods 1917,[1] assumes that the disease is an anaphylactic uveitis, brought about thus: "The injury to the uvea in the exciting eye, by trauma, intraocular tumor, etc., leads to a destruction or disintegration of the uveal tissue. This uveal tissue is absorbed, and acts as a foreign protein, or antigen, to the organism, and produces a hypersensitiveness of the organism, and especially of the homologous organ, the second eye. A reaction now takes place between the sensitized uvea of the second eye and the antigens circulating in the blood lymph. This anaphylactic reaction, or intoxication, is manifested clinically as a sympathetic ophthalmia."

In an invitation address before the Academy of Ophthalmology and Oto-Larngology, Section of Instruction, in Washington, D. C., 1923, in speaking of sensitization and anaphylactic intoxication of the tissues of the eye, Woods[2] says, "thus it is seen that thru general sensitization of the body, the ocular tissues are sensitized, and that if an intoxicating injection is given in the eye local inflammation results. But if the intoxicating injection is given in the body, we have only symptoms of anaphylactic shock. If the sensitizing injection is given in the eye a special sensitization results, in addition to a general sensitization. If the intoxicating injection is given in the eye, local ocular inflammation is obtained and little general reaction. If the intoxicating injection is given in the eye, local ocular inflammation is obtained and little general reaction. If the intoxicating injection is given in the body, not only is a general anaphylactic shock obtained, but likewise a special inflammatory reaction in the eye. From this it is seen that the eyes are sensitized as part of a general sensitization, the body tissues are affected by foreign protein absorbed from the eye, and, lastly the eyes are capable of inflammatory reactions which are purely anaphylactic in character."

On this theory it might be assumed that sensitization took place during the inflammatory stage; and that the intoxicating injection could be body intoxication from a focal infection, thus creating an anaphylactic reaction.

That uveal pigment plays a part in this condition is not so easily understood nor explained. We might assume that the disintegrated pigment, acting as antigen, could be carried back by the circulation into the same eye; and that the toxin from a focal infection would act as the complement, thus producing the anaphylactic reaction and causing a sympathetic uveitis. This would be in line with the theory that disease such as subacute and recurring arthritis may occur, due to absorption of damaged material from the inflamed joint acting as antigen, caused by focal infection exciting the already sensitized joint.

Might not the already sensitized eye become excited, due to its own pigment acting as an antigen caused by focal infection; based upon the theory, that while there was an anaphylactic

action it was not immunizing? Woods' conclusion, "that the eyes may be sensitized as a part of a general sensitization and that anaphylactic phenomena may be elicited in an eye by means of antigen carried in the blood stream" I think bears out this idea.

Other theories might be presented. Metastasis, which assumes that the disease is bacterial in origin, thru bacterial metastasis from the exciting to the sympathizing eye, either thru the blood and lymph channels, or by actual migration of the bacteria along the optic tract. We have cases reported of metastasis in the eye, but these usually produce abscesses.

Cytotoxins, in which there is supposed to be a cellular poison developed by distintegrating uvea that is specific for uveal tissue. This theory would hardly hold good with cases of this kind. A third theory has to do with changes in the acidity or alkalinity of tissues, known as acidosis. Fatigue is one of the causes of acidosis and that such a condition could occur localized in an eye which had been injured does not seem entirely out of the question. Such an eye will be more susceptible to infection and this could occur by the blood stream carrying an intoxication from a focal infection.

It has always been a mystery to me, why, in the socalled idiopathic cases of iritis, there is but one eye affected. This theory might explain to some extent the reason. From eyestrain, or local irritation from other causes, the eye becomes fatigued and thus becomes more susceptible to sensitization.

CASE. G. A. Aet 42, Madison, Illinois. May 11, 1923 he received a piece of hot iron scale in his left eye, causing a secondary burn of the conjunctiva at 7 o'clock at the sclerocorneal margin. He gives a history of having had this eye sore in 1916, but no previous history of injury. There are several synechiae of the iris, evidence of an iritis probably at that time. After 10 days' treatment the eye was considered well. In June 21, 1922, he returned with a new attack of iritis; under treatment the eye recovered again. Wassermann negative. July 7, 1923 returned with another attack. Wasserman made again, negative report. This attack began 10 days before, at which time he was away from the city and was treated by some one else. The iris was completely bound down with exudate in the pupilliary area. Tension 33 McLean. Extreme tenderness especially in the upper outer quadrant. (To this symptom, I wish to say, I called attention in 1909 before the Ophthalmic Section and have never seen it mentioned until I found it described under the heading Premonitory Symptoms, in de Schweinitz' last edition.)

12/4/23 tension 42 McLean. Did iridectomy. Tension relieved and remained at 20, but intense pain prevailed especially in upper outer quadrant and eye remained inflamed.

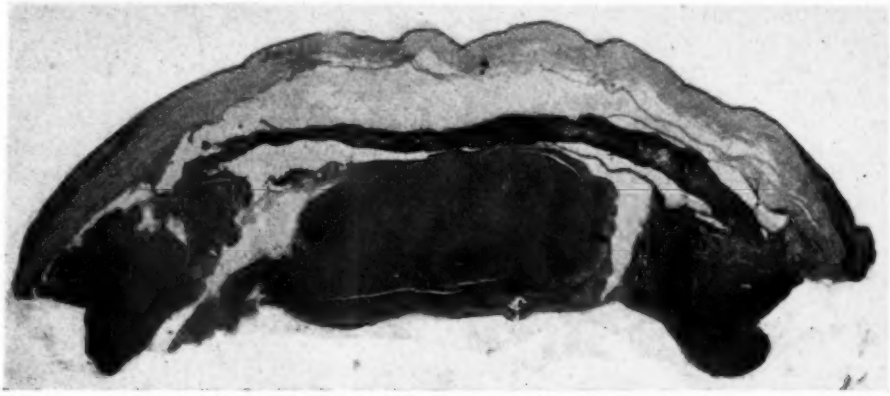

Fig. 1. Near meridional section thru excised portion of eyeball.

12/19/23 teeth X-rayed and apical abscesses found upon three, which were removed. Within 2 days the eye showed a marked improvement in inflammation in sclera and clearing of cornea. He still had pain in the upper outer quadrant and after some persuasion he consented to have the eye removed.

12/23/23 I eviserated eye.

At no time during any of these attacks did his right eye show signs of sympathetic irritation. Vision remained 20/20; he made an uneventful recovery and on 3/11/24 vision in the right eye was 20/20.

The possibility of an infection carried into the eye at the time of doing the iridectomy, of course must be considered. Yet the eye did not show any special reaction indicating such to be the case. My conclusions therefore are: that either due to the early disease or the later operation, that I did, the eye took on a susceptible sensitivity to microorganisms from the focal infection and thus an anaphylaxis took place resulting in this disease.

PATHOLOGIC EXAMINATION BY DOCTOR H. D. LAMB.

The excised part of the globe consisted of the anterior fourth of the eyeball, the section passing thru the anterior portion of the orbiculus ciliaris. The tissue was fixed in Kaiserling's solution, imbedded in celloidin and sections stained in hematoxylin and eosin.

Microscopic examination of the cornea shows but little change; the anterior epithelium is generally thinner and consists of fewer layers of epithelial cells than is normal; also there is present thruout the substantia propria a small amount of diffuse infiltration with polymorphonuclear leucoyctes and small lymphocytes, which lie flattened between the corneal lamellae.

The conjunctival tissue, under the epithelium beyond the limbus, shows considerable sclerosis or formation of connective tissue, containing many capillaries. These capillaries contain some polymorphonuclear leucocytes, as well as red corpuscles. The connective tissue in this location shows many fibroblasts and infiltration with small lymphocytes, plasma cells, polymorphonuclear leucocytes and mononuclear eosinophile cells, (degenerative derivatives of plasma cells); an occasional Russel's body is seen.

The iris shows marked atrophy, with the presence of many new formed blood vessels, most of which are capillaries. There is a marked proliferation of chromatophores. These cells appear as large, coarse, branching cells, containing much golden-brown pigment (melanin). The iris stroma shows a marked diffuse cellular infiltration with small lymphocytes, plasma cells and the mononuclear eosinophile cells. An occasional Russel's body is seen. The pupil is completely occluded with a thin layer of cicatrical tissue, containing fibroblasts and infiltrated with small lymphocytes, plasma cells and chromatophores. This cicatricial layer is closely adherent to the anterior lens capsule and is continuous with similar cicatricial layers forming posterior synechiae on each side. The iris angle is open on one side, where the meshes of the ligamentum pectinatum are coated with many small lymphocytes and plasma cells. On the other side, the iris angle is closed for a long distance forwards and no remains of Schlemm's canal, nor of the meshwork, are left.

The emissary blood vessels, in the anterior portion of the sclera on both sides, show well marked covering with small lymphocytes, plasma cells and mononuclear eosinophile cells; on one side the vessels contain many polymorphonuclear leucocytes.

The ciliary body is atrophic with rather marked destruction of the ciliary muscle bundles and much new formation of connective tissue in their position; there is also much diffuse proliferation of chromatophores thruout this connective tissue; besides chromatophores and fibroblasts there is a diffuse infiltration with small lymphocytes, plasma cells mononuclear eosinophile cells and a few Russel's bodies. Along the inner side of the ciliary body in about the position of the vascular layer, there is a very dense infiltration with plasma cells, small lymphocytes.

mononuclear eosinophile cells and a small number of epithelioid cells.

On the inner side of the ciliary body there is present a very thick cellular exudate, which quite completely fills the space between the ciliary body and the lens and extends to the bottoms of the furrows between the ciliary processes. The cells composing this exudate are small lymphocytes, plasma cells, fibroblasts (proving organization of exudate), polymorphonuclear leucocytes and epithelioid cells. The inner epithelial layers of the ciliary body are quite well preserved anteriorly, whereas posteriorly they are much broken up and destroyed by the cellular exudate on their inner side.

The lens has considerable remains of posterior synechiae on its anterior capsule; it also shows the effect of having the lens capsule pulled outward by the masses of exudate on each side, which on one side has caused a rupture of the capsule and a protrusion outward and backward of some of the lens fibers; there is seen some liquefaction or cataract changes laterally and posteriorly.

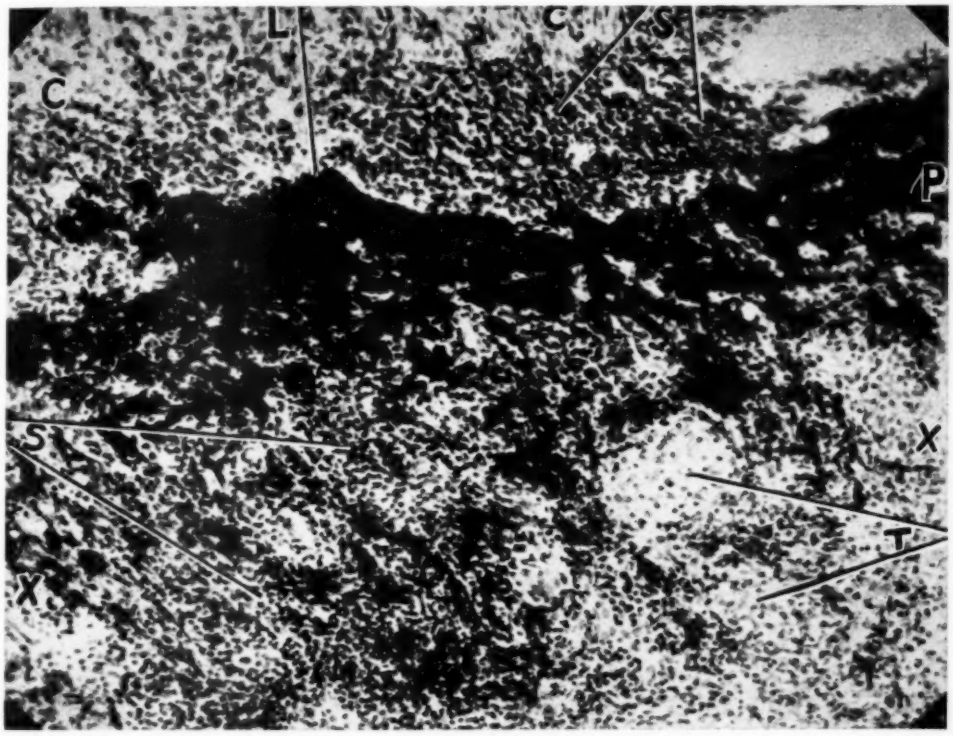

Fig. 2. Section thru posterior portion of ciliary body (C) and portion of cellular exudate (X), showing clumps of pigment (P) from pigmented epithelial layer (L) of ciliary body, small lymphocytes (S) and epithelioid cells (T).

DIAGNOSIS SYMPATHETIC UVEITIS FOLLOWING OLD UVEITIS.

Thru the kindness of Doctor F. E. Woodruff, prepared sections of this case were seen by Professor Ernst Fuchs, last summer. His notes in brief follow:

Altho the history of the case gives no evidence of a perforating injury, rupture of the lens capsule with folding is certainly not due to the evisceration, but is indicative of a previous perforation. The infiltration of the iris is due to plasma cells and besides this diffuse infiltration there exists foci of denser accumulation of cells, which, as it is the rule, are lymphocytes. The cells designated in the description as mononuclear eosinophile cells are not such, but are cells called plasmacytoid cells and were described at first

by myself and later more in detail by my son. They are distinguished from the genuine eosinophile cells by having a much larger protoplasm, only one nucleus, absence of the brilliancy of the red granulation characteristic for true eosinophile cells and other reactions, to staining agents. (see v. Graefe's Archives Vol. 103, 1924, page 228). The Russel's bodies, present in the iris, have developed from plasma cells.

The condition of the iris corresponds to the socalled iritis traumatica serosa,[4] which clinically is distinguished by the absence of plastic exudation and the presence of precipitates, or of a continuous layer of exudate on the posterior surface of the cornea, starting from the lower angle of the aqueous chamber. In this case such a coating is visible as a layer of connective tissue, extending from the inferior angle upwards, the exudate having already become organized.

The exudate on the surface of the ciliary body does not form part of the anatomic picture of iritis traumatica serosa, in which an exudate at the surface is usually absent. Neither is it due to endophthalmitis, in which case the exudate would long since have been converted into dense connective tissue. This exudate shows the characteristic features of sympathizing ophthalmia, i. e. nests of epithelioid cells and some giant cells. In cases of iritis traumatica serosa, sympathizing ophthalmia is rare and it is still more rare to find it in cases, in which the other eye did not become affected. In spite of that my belief is that the case is one of sympathizing ophthalmia.

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VERTICAL NYSTAGMUS WITH FIXATION PHENOMENA.

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BROOKLYN, N. Y.

The two cases here reported were characterized by vertical nystagmus and fixation of the eye upward in spite of an effort to look down, coming on many months after an attack of lethargic encephalitis. Reports of similar cases are found in the literature. They are likely to be mistaken for cases of hysteria. From the Department of Neurology, Long Island College Hospital.

Two cases have come to my attention within the past six months of postencephalitic Parkinson's syndromes showing peculiar eye symptoms. These symptoms when referred to two recognised ophthalmogolists were considered as hysterical symptoms. In investigating the literature I find that Fischer has described a similar condition in five cases, Ewald reported five cases, Meyer reports two cases, and Hohman in this country has reported four cases. Because of the apparent understanding among ophthalmologists that such a condition is representative of a functional disorder in the brain, it would seem to be worth while to report such cases, as they apparently are disorders arising during the development of postencephalitic syndromes.

The cases in this report have both the vertical nystagmus and the holding of the eyes in the upward position. The attacks of nystagmus vary in each of the patients as to their frequency and duration. In the first case the attack occurred as often as five times in one day, while again it might occur only once. In the second case it averaged about three times a week. The vertical nystagmus consists of an upward arm, slow and jerky, while the down-

ward arm is a rapid return to the normal position. The rate varied from 40 to 48 per minute. Finally the eyes would become locked at the termination of the upper arm of the nystagmoid movement, and would remain in this position regardless of the patient's attempts to bring them down.

It was the holding of the eyes in this position that disturbed the patient, and caused him to seek medical advice. There is no particular discomfort experienced during the attack, except the involuntary movements of the eyes and lack of control over these movements. The attacks may last from a few minutes to four hours, the longest period experienced in the second case. In careful examination of both cases in question, these movements could not be found to be associated with any particular state, acts or movements, time of day, or thoughts or suggestions, on the part of the patients, or of those associated with them.

Both cases were typical Parkinson's syndromes and represented late manifestations in the course of the disease. In the first case the nystagmoid movements were first noticed two years and four months after the acute onset, and these continued eight months before the holding attacks began. The latter then continued to increase in frequency and in duration. In the second case, the nystagmoid movements began two years and six months after the acute attack, and the holding attacks began four months later. These have also been progressive in nature. Examination of the first patient showed a slight muscle imbalance of the eye muscles in general; otherwise there was nothing abnormal found during the ophthalmologist's examination. In the second case the eye examination was negative except for a slight pallor of the discs, a condition often seen in postencephalitic cases.

Following is a brief summary of the two cases observed.

Case 1. H. C. J., age 24, single, druggist, had an acute attack of encephalitis lethargica in June 1921. The acute attack consisted of a high fever, diplopia, restlessness, insomnia and at first was diagnosed influenza. This condition cleared up in ten days, and left the patient drowsy and weak for about five weeks. He then returned to business and continued up to October 1923, when he first noticed upward movements of his eyes which he could not control. These movements annoyed him, but he continued at work; as they would only appear two or three times a week and the duration would vary from 2—3 minutes to thirty at the longest. These attacks increased in duration up to the time of the examination. In May, 1924, during one of these attacks, the eyes turned upward and remained in that position. The patient was unable to move the eyes in any direction during the holding attack. From this time on these holding attacks increased in frequency and in duration, necessitating the giving up of his position.

At the time of the examination, June, 1924, there was loss of automatic associated movements, and the gait was typical of the Parkinson syndrome. The patient admitted that he had been unable to accomplish as much work in the past four months as he had been accustomed to do; that it also required more effort to move about, and that he had a feeling of stiffness in all of his muscles. All of this had caused no anxiety until his eyes "became fixed." There was no tremor present in this case. The reflexes were very active. The laboratory findings were normal. The ophthalmologic examination showed a slight imbalance of the eye muscles in general, otherwise normal.

Case 2. E. A. A girl, aged 17, single, operator in a shirt shop, had an acute attack of encephalitis lethargica four years previous to the examination. This was a mild attack, slight fever, insomnia and diplopia, lasting over a period of two weeks. The patient noticed her left hand trembling, one and one half years before coming under observation. This tremor spread to the right hand and arm, and in a few months both legs were involved. She noticed that she was drowsy and had lost considerable of the ambition which she previously had. She became well

satisfied to sit in a chair and have other members of the family wait upon her. During this time, she lost the power of automatic associated movements, walked with her arms semiflexed and her head and neck in a rigid position. She complained of saliva running from her mouth. About one month after the onset of the tremor in the left hand she was conscious of a tremor of the eyelids, and that her eyes would move upward, for varying periods of time. The eyes would return to their normal position, but immediately move upward again. Finally they would remain in the elevated position, and she would be unable to bring them down. People would ask her what she was staring at. The vertical nystagmus preceded the holding of the eyes in the upward position by about four months.

Neurologic examination showed a well advanced Parkinson syndrome. Knee jerks very active, altho there were no pathologic reflexes present. Blood and spinal fluid Wassermann negative. Blood pressure 110/60. The spinal fluid was not under abnormal pressure, but showed an increase in cells, twelve per cu. mm., otherwise negative. All other laboratory findings were within normal limits. Pupils reacted to light and accommodation. No evidence of muscle paresis or imbalance of the eye muscles. The discs were slightly pale, left more than the right.

SUMMARY.

This ocular syndrome is apparently one more added to the rapidly increasing list of sequelae following encephalitis lethargica. Its presence, in the midst of an accepted symptomatic picture produced by definite brain pathology, would seem to place this condition upon an organic basis; rather than a psychogenic disorder as heretofore considered. As to the site of the pathology it would be mere speculation; but one can at least think of the midbrain as a possibility, since so many of the investigators have found pathology in this region in postencephalitic Parkinsonian syndromes.

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METHOD FOR ENUCLEATION OF THE EYEBALL.

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PHILADELPHIA, PA.

In this operation sutures are introduced in the tendons of the recti muscles before they are divided. After removal of the eyeball the opposing tendons are tied together and the conjunctiva brought together over them. Read before Section on Ophthalmology, College of Physicians of Philadelphia, Feb., 1926. See p. 518.

Several years ago, I presented to this section a method of total enucleation of the eyeball which had for its object the approximation of the ocular muscles with their attached lateral tendinous expansions in such a manner as to make a closed pouch which was then covered by the free conjunctiva. The sutures employed were tied around the muscles in a manner similar to the Worth operation for advancement of the ocular muscles. This made many confusing ends of thread during the operation and much time was consumed, tho the final result was good.

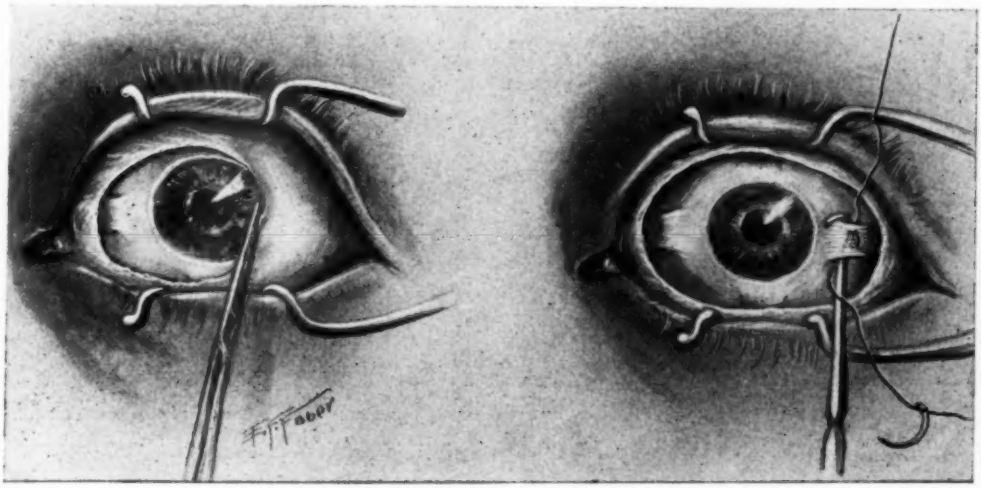

Fig. 1. Shows the dissection of the conjunctiva carried well back.
Fig. 2. The mattress suture is introduced similarly into each muscle.

In our experience with this operation, I found that the sutures in the muscles strangulated the circulation and caused a slough of the terminal ends of the muscles which sloughs had to be removed in the course of a few weeks. It was also discovered that the operation could be made very simple and most excellent results obtained in the modified operation which I am about to describe.

In this operation, the healing is rapid, the buried black silk threads used make their appearance in from two to three weeks and are readily removed by traction, leaving a smooth surface. After this operation, the upper lid retains its function, the socket and glass eye can be moved up and down or sidewise, depending upon the fit of the prothesis. The von Graefe lid sign and the staring eye appearance is totally absent.

THE OPERATION.

After the eye is prepared in the usual manner, the conjunctiva is dissected from the corneoscleral margin, being thoroly loosened all the way back to the fornix. A large strabismus hook is introduced behind the internus and pulled forward until the internal rectus with the tendinous expansions of Tenon's capsule are clearly outlined. The curved needle threaded with No. 4 black silk is carried from above behind the muscle to the middle third. When it is brought thru, it is reintroduced into the upper third of the muscle, passed behind and out underneath the muscle below the lower edge. These sutures are introduced about four mm. from the scleral attachment of the

muscles. The ends of the silk thread are held with the hemostat. The thread is held taut while the tendon and its attached capsule are removed from the eyeball with a curved scissors. The external rectus is treated similarly, also the opposed tendons of the superior and inferior muscles. The four hemostats hold the threads of the four separated muscles. The eyeball is then removed in the usual manner by cutting the optic nerve. After a few minutes of pressure, when the bleeding has ceased, the socket filled with blood clot is enclosed in the following manner: The needle and thread first used, that is, in the internal rectus muscle, is introduced external to the sutures in the external rectus, brought back and tied to its fellow thread of the internal rectus. Similarly, the needle and thread of the external rectus is introduced internal to the suture in the internal rectus and tied. Similarly, the superior needle passes thru the inferior tendon and is tied. Then, the needle in the inferior tendon is passed into the superior and tied. The conjunctiva is

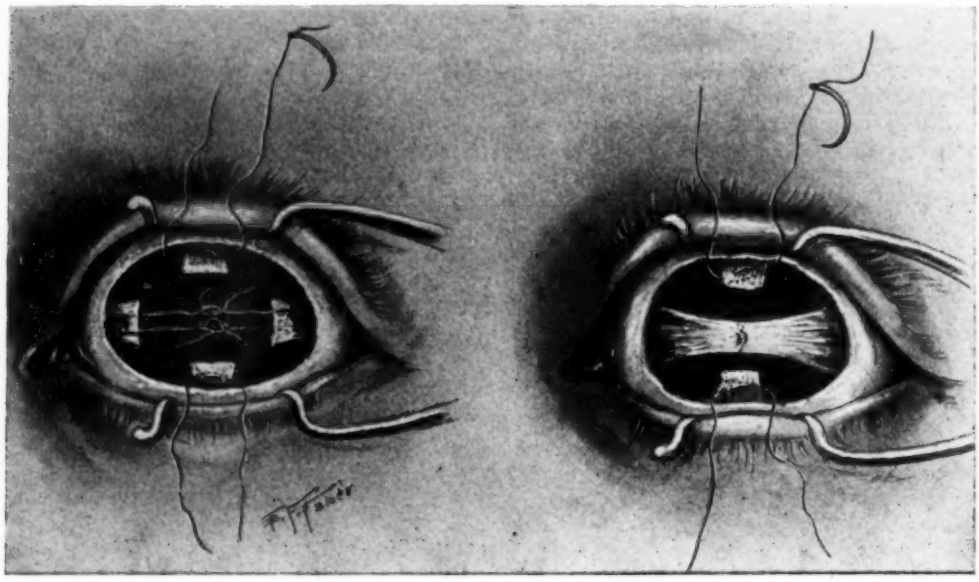

Fig. 3. Suture carried behind mattress suture of opposite muscle and tied; bringing muscle ends in contact in middle of orbit.

Fig. 4. The sutures tied. Getting ready to tie the vertical muscles.

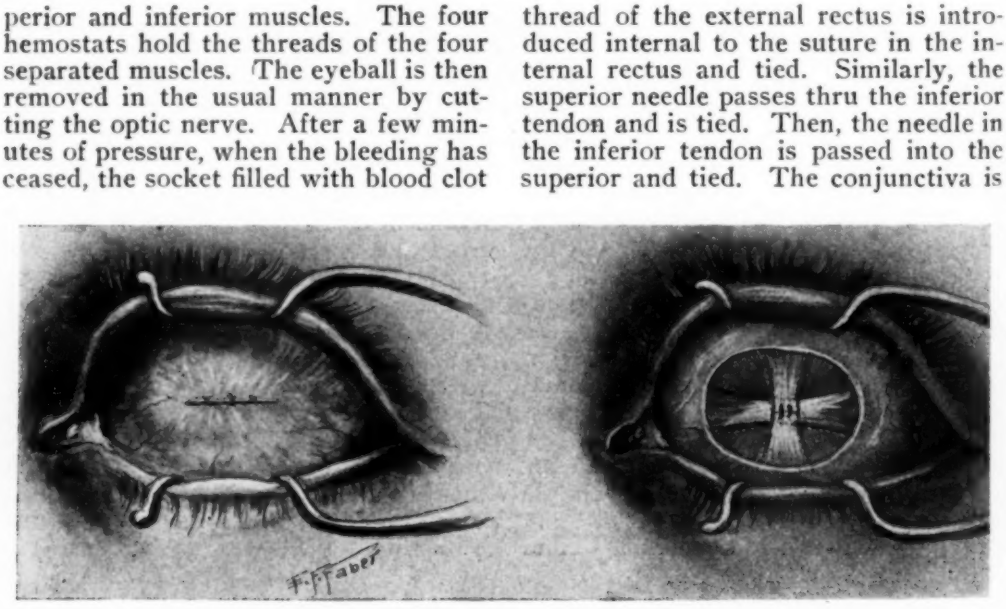

Fig. 6. The smooth conjunctival covering of the finished operation.

Fig. 5. The muscles and Tenon's capsule form a pouch covering the contents of the orbit.

then brought together and sewed together horizontally with a few interrupted sutures.

Should there be much pouching laterally, a small slit, or a small triangular piece of conjunctiva removed, will make a smooth wound. The eye is then flushed and dressed in the usual manner. The conjunctival sutures are removed in three days. The deeper sutures, usually cause an irritation in about three weeks, when they can be readily removed by traction. This makes a very clean movable socket. The great advantage of complete enucleation of the eyeball without the introduction of any foreign substances must appeal to anyone who has seen the foreign body extruded later. There is a feeling of comfort in the knowledge that the danger of sympathetic ophthalmia is definitely removed. This is not always the case when the sclera and optic nerve are retained, or when a gold or glass ball is implanted. I have performed the operation quite a number of times with infinite satisfaction.

The operation can be simplified by simply tying the sutures introduced in each muscle as above described, to the end of the sutures in the opposing muscle, but I have obtained the best final result by catching the threads behind the mattress suture of the opposite side, as described in the body of the paper.

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CERTAIN ASPECTS OF GLAUCOMA.

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No single explanation of glaucoma fits all cases. The forms here discussed are those following cataract extraction, juvenile glaucoma apart from buphthalmos and glaucoma in myopic eyes. These belong rather to the division of simple glaucoma. Illustrative cases of each are reported. Read before the St. Louis Ophthalmic Society, January 29, 1926. See p. 543.

The subject of glaucoma is so broad, the manifestations of the disease so protean and the etiology so obscure that a discussion of this bête noir of ophthalmology must of necessity be limited to some phase or aspect of the condition. The interest in glaucoma remains unabated since it continues an open chapter. Hardly an ophthalmologic meeting is held by the larger societies but that one or more papers dealing with glaucoma are presented. That this testifies to the unsatisfactory solution of the question, the failure to solve the riddle so to speak, is obvious and patent. Those aspects of glaucoma which I wish to discuss tonight are by choice limited to chronic simple glaucoma occurring in three distinct and unrelated classes of cases, viz. (1) Glaucoma following cataract operation. (2) Juvenile glaucoma, not to be confounded with buphthalmos. (3) Glaucoma in myopic eyes. Each of these subdivisions justifies, in reality, a separate and complete paper, however, the present communication will briefly consider the conditions and relate a number of case histories bearing on the points at issue.

None of the ordinary explanations of the etiology of glaucoma in myopia will satisfactorily account for the juvenile, myopia and postcataract types. The usual freedom from glaucoma must be accounted for, in the main, on anatomic grounds. The myopic eye is relatively, or actually, a large or elongated eye. The hyperopic eye, so commonly met with in glaucoma, is a relatively, or actually, small or crowded eye. All spaces are smaller in the latter, since the lens is fairly constant in size in all human eyes at a given age. Glaucoma the result of iridocyclitis or other inflammatory cause, from trauma, or tumor, is outside the present discussion. The fact of the matter is, that no one cause is responsible for all glaucomas, but that a number of etiologic factors may be operative. I am referring solely to chronic simple glaucoma. There are mechanical, anatomic, sclerosing or tissue changes, neuritic and secretory phenomena, the last two closely related; and possibly

other factors influencing the development of glaucoma. No one type of operation or form of therapy will relieve all cases. Many of our disappointments and much of our pessimism regarding glaucoma may come, figuratively speaking, from trying to fit a square peg into a round hole. Simply doing an iridectomy does not open up the iris angle in its whole circumference. Iridotasis is better calculated to do this yet the inclusion of the iris in the lips of the wound, in this procedure, is the real cause of maintaining filtration. This is borne out by an analogous condition viz: the lowered tension met with in cystoid scars. Why is iridectomy sometimes beneficial and many times futile? Why does an eye go right on to blindness after a technically perfect iridectomy, with a consequent intraocular tension which never rises above 20 mm. Hg.? Why do some patients retain fairly good vision and fields for a long time, even with elevated tension? Eventually field and vision must go, for the ganglion cells of the retina cannot indefinitely withstand abnormal pressure. Tension is not everything, drainage is not everything. There is more to glaucoma than these. Priestley Smith's definition of glaucoma covered the ground thoroly, as a generalization, and explained nothing.

It has been my misfortune to have had a number of patients develop glaucoma of the chronic simple variety following cataract extraction. In none of them, so far as I can remember, was there any accident or immediate complication, to mar or alter the result. Atropin was used postoperatively in all instances. One patient returned 2 years after cataract operation with a perfect iridectomy and clear media, but with cupping, raised tension, atrophy and greatly reduced vision. In another case glaucoma supervened after operation on each eye, done a year or so apart. This was combated for a time with miotics, paracentesis, anterior sclerotomy and finally trephining. In another instance the eyes were judged to be in a preglaucomatous state before operation for cataract; but this was interpreted as due to swelling of the lens, in a rapidly developing cataract, in a youngish individual. In one case there was some retained cortex; in the others little or none, at least none visible.

Would these patients have developed glaucoma if no operation had been done? I am at times inclined to believe so. Perhaps the cause is to be sought elsewhere. Is it due to the type of incision, retained cortex, incarcerated iris, lens capsule, or vitreous? The etiology of an acute outbreak after operation is more understandable than the chronic case. It is possible that the incision involving or destroying a section of Schlemm's canal is at fault. In our zeal to refrain from making a purely corneal incision and our desire to obtain a large conjunctival flap may we not seriously traumatize Schlemm's canal and the tissues closely related thereto? How can a tag of iris, shred of capsule, vitreous or cortex shut off drainage to a sufficient extent to produce glaucoma *unless* the patient was already predisposed; i.e. preglaucomatous? Bearing in mind this possible predisposition, the indiscriminate use of atropin after extraction is not without danger.

At this point it is not amiss to refer to the virtues of preliminary iridectomy. This measure insures a well executed iridectomy, basal if desired, and puts the eye in a better condition to withstand cataract extraction, should a state of glaucoma be impending. It obviates the bleeding into the anterior chamber from a freshly cut iris, allows of a larger and better removal of anterior capsule, lessens traumatism in manipulation, permits of a better section, in that there is no iris entanglement. It is conducive to the thoro removal of cortex by lavage, and avoids excessive reaction on the part of the iris the result of traumatizing it by manipulation and cutting, or irritating it by the presence of retained cortex. In brief, preliminary iridectomy makes for a better performed operation and an abbreviated convalescence, at the same time eliminating a number of factors favoring the development of glaucoma either acute or chronic.

Acute postoperative glaucoma is not a part of this discussion. Reference above is made to the fact that as little

cortex as possible should be left behind. A plea for lavage is therefore made. Remaining cortex acts as a foreign body, irritates the iris and ciliary body, thereby provoking exudate, delays recovery, sensitizes the other eye to lens protein, mechanically blocks excretion of aqueous from the eye and at times proliferates, making secondary operation imperative. One or more of these things may make glaucoma possible. The necessity for needling should be avoided as much as can be. Glaucoma not infrequently follows needling. This has been investigated by P. Knapp[1], who found that tension increased in those discissions done late or done repeatedly. Hence the advisability of early discission. Any procedure making discissions unnecessary is a consummation devoutly to be wished. Gifford[2] mentions glaucoma from cataract disintegration occurring spontaneously. If such a thing can happen spontaneously there is no reason to doubt that the same consequence may more frequently follow operation for cataract, when considerable cortex is left behind. Therefore if a good deal of cortex remains after operation in a supposedly mature cataract, or if necessity compels work on an immature cataract, lavage of the anterior and posterior chambers should be resorted to if no contraindication such as fluid vitreous exists or vitreous loss occurs. Risley[3] met with a case of glaucoma going on to blindness, in which an extraction with iridectomy had been done 17 years previously. Lambert[4] recorded the case of a young girl with glaucoma which developed three years after the removal of the remains of a cataractous lens, the result of a perforating wound of the cornea.

Bearing on the incidence of postcataract glaucoma is the record of 2,260 cataract extractions done in the Cracow Clinic; 6 were followed by postoperative glaucoma. Presumably these were of the acute type. Acute glaucoma following operation is likely to be recorded as part of the hospital record, whereas chronic simple glaucoma, coming on months and years after operation, is unrecorded and its incidence inaccurately estimated. No attempt is made in this paper to outline remedial measures at our disposal. At the best they are all too unreliable and inconstant in furnishing relief. Some type of filtering operation seems indicated, with the procedure of Dr. Luedde standing high in the list.

GLAUCOMA AFTER CATARACT.

CASE 1. N. P. white female, age 69. Cataract R. and L. Mature in L. on which did a preliminary iridectomy in July, 1922. Light projection good in all directions. Cataract extraction Jan. 24, 1923. Smooth operation. No accident or complication. Dressed 3rd day. Some residual cortex, iritis present, pain. Used atropin and aspirin. Feb. 14 pain off and on. Feb. 19 seen at office, eye becoming white, cortex absorbing. Mar. 13 comes with eye in state of glaucoma, red, steamy cornea, hard, and painful. Subsided under eserin and hot applications. Mar. 26 eye white, no pain. Continue eserin. Mar. 30, L. vision, + 11.00 S. + 1.00 C. axis 30° = 7/13. Apr. 3 return of glaucoma, not so severe. Apr. 30 symptoms subsided, eye white, no pain, eye hard. May 14th tension, right 22, left 77. Paracentesis done, later a sclerotomy. Between this time and Oct. 22 O. S. had a stormy time, going thru acute glaucoma, followed by acute iritis and later chronic glaucoma. Oct. 22 did a cornescleral trephining, above. Since that time L. has had several ups and downs. January 18, 1924 tension L. 19, vision 6/30, good bleb.

Nov. 5, 1923, cataract extraction R. No accident, or complication. Slow recovery with considerable reaction of eye. Dec. 20 eye nearly white, most of retained cortex is absorbed. Jan. 18, 1924 eyes in best shape for a long time, tension R. and L. 19, both eyes white, pupillary membrane, R. needling will be required. Mar. 7, 1924 needling done R. Mar. 21 eye white. April 15, tension R. 22, L. 19. June 21, 1924, pain and redness R., tension up, did a sclerotomy. Between this time and May, 1925, had several attacks of iritis. Last note, by Dr. Flury made during my absence, in June, 1925, was tension R. and L. 20.

CASE 2. Mrs. F. W. S., white, age 48. Cataract R. and L. Mature in L. Had general physical examination made. Wassermann, negative. Urine, nega-

tive, except for a few red blood cells and pus cells. Discharge from right ear. Blood pressure, systolic 235, diastolic 120. Menopause at 44. Patient heavy and full blooded. Nov. 5, 1924 combined extraction. No accident or complication. Dec. 10, uneventful recovery. No cortex. Jan. 31, 1925 O. S. + 8.00 S. = + 5 C. axis 165° 6/10. There is a fine horizontally ribbed membrane in lower part of pupil. Mar. 17, vision not as good as formerly, tension raised (39). April 7, tension, right 24, left 33. Using pilocarpin 1/120 t.i.d. and eserin 1/240, at bedtime. Eye appears to be better since using miotics regularly. Will have to consider some type of filtering operation. June 12, 1925 seen by Dr. Flury, in my absence. Vision has slipped to 20/75—, tension R. and L. 27 mm. Hg. The patient has not been seen since, and has probably sought advice and treatment elsewhere. In this case there was high blood pressure and rapidly developing cataracts. What influence, if any, these factors had in the causation of glaucoma it is difficult to say.

GLAUCOMA IN JUVENILES.

Glaucoma is unusual before the 40th year, rare under 25, and quite rare under 15 years of age. Of the thousands of clinic cases coming under my observation in the past 15 years, I do not remember having seen chronic simple glaucoma, buphthalmos excluded, in one so young as 13 years, or even under 18 years. W. T. Davis[5] reported the case of a white boy of 11 years, with chronic simple glaucoma, tension R. and L. 50 mm. Hg. Lowell[6] reported an instance of glaucoma in a boy of 17 years. He finds himself in agreement with Abadie in believing that there is a distinct difference between chronic juvenile glaucoma and buphthalmos, and that the tension in the former is due to affection of the sympathetic. In congenital glaucoma (buphthalmos) there is said to be a failure of development at the iris angle. Such an explanation, if true, does not fit the juvenile type, in which the disease manifests itself at or around the adolescent age.

A number of references are met with in which juvenile glaucoma occurred extending thru a number of generations. Haag[7] found from the records of the Tübingen clinic that (1) hereditary influences are not decidedly more frequent in juvenile than in ordinary glaucoma. (2) That there is no essential difference between juvenile and senile glaucoma and (3) that myopia predisposes to glaucoma. Just how he arrives at the last conclusion is not clear. Lohlein has been quoted as holding the opinion that 50 per cent of the cases of juvenile glaucoma are myopic. Toughness of the sclera has been noted in juvenile glaucoma as well as in adults. Whether it is a cause or result of glaucoma in children is not clear to me. Condensation of the fibrillar structure of the sclera seems to be a characteristic of long standing glaucoma. A sclerosis of all tissues of the body might be said to be a physiologic concomitant of age, and thereby be a factor in the causation of chronic glaucoma of the adult of middle and later life. But what of juvenile glaucoma? The tissues of youth are normally elastic and yielding.

CASE 3. R. L., colored, female, age 13 years, was brought to the clinic by the school nurse for refraction. R. V. = 20/30 without glass. L. V. = 20/24 without glass. Owing to a dearth of material for demonstration to the class of undergraduates in ophthalmoscopy, this patient with two other little colored girls was taken into the dark room for exhibition. Normal findings were expected. A brief look was taken at each fundus before allowing the students to examine the patient. I made the remark that if it were not for the age of the girl I would say that she had chronic simple glaucoma. The appearance of the discs was a textbook picture. The possibility of a congenital malformation was thought of. The girl was turned over to Dr. Lawrence Post, with a statement that the fundus picture was one of chronic simple glaucoma and his laconic reply was, why not? Dr. Post immediately took the fields roughly with his fingers, and demonstrated a decided narrowing of the fields. Tension taken with the Schiötz tonometer revealed an increased tension; R. 31 and L. 36. The diagnosis of chronic simple glaucoma

was not in doubt. Subsequent examinations confirmed the previous findings. The child was put in Barnes Hospital and an iridectomy was done on the left eye, Jan. 8th, 1926 by Dr. Hayward Post. Dr. Post was forcibly impressed with the toughness of the sclera on making the keratome incision.

GLAUCOMA IN MYOPIA.

Emphasis has been laid on the importance of taking glaucoma into consideration in myopic eyes. The position that myopia insures against glaucoma, must be abandoned. Many eyes, no doubt, have been allowed to deteriorate with the sublime confidence and comforting assurance that such deterioration was due to the myopia progressing, or to myopic choroidal changes, when in fact glaucoma was present. That most of these cases are of the chronic simple variety, fosters and accentuates this oversight and error. The relative infrequency of glaucoma in myopia may be based, as mentioned before, chiefly on anatomic grounds. From the anatomic viewpoint the myopic eye *should* be less liable to glaucoma. May it not be possible that the rigid unyielding sclerotic of the small eye of the hyperope favors the onset and the less tough, yielding sclerotic of the larger myopic eye lessens the likelihood of glaucoma? The same thought has been expressed by Brown[8]. Glaucoma in myopia, the result of an uveitis, must be ruled out of consideration, as should also all secondary and complicated cases. A myopia of moderate degree associated with glaucoma may be and probably is due to the change in refraction incident to the glaucoma.

Lange[9] and Gilbert[10] quoted by Knapp,[11] found myopia present in about one-third of the cases of glaucoma simplex, while myopia occurred in only one-tenth of the cases of congestive glaucoma. Knapp, in the article referred to, mentioned having records of 32 cases of chronic glaucoma in myopic eyes. The degree of myopia in 26 was below 5 D.; in 6 it was between 5 and 10 D. Tyson in discussing Knapp's[12] paper mentioned having observed glaucoma in myopes, ranging from —1.25 D. to —16.00 D. In 75 per cent of the cases tension was kept within normal limits with miotics. The one herewith reported differs from Knapp's cases, in that the degree of myopia was higher (—11.00 D.) and the type of glaucoma was subacute, being thereby the exception proving the rule.

CASE 4. J. J., age 45, male, was first seen Jan. 6, 1919, "always near sighted." Sight blurred for past few days, no pain, sees colored rings about light last 3 days. A. C. normal depth, R. and L. Right, vision, with glass, 20/60. Left, vision, with glass, 20/48. Shows —10.75 sph. R. and L. R. is congested and somewhat reddened. Pupil is enlarged but reacts to light. Tension, Schiötz R. 55 mm. Hg. Left, 15 mm. Hg. Media fairly clear. Could not make out any cupping. With pilocarpin, 1/240, the tension of the right eye was reduced to 18 mm. Hg. in one week. No more halos. Four weeks after first visit tension right eye was 12. He was kept under observation at intervals for over a year, tension never rising above 18. A note was made in May 1920, as follows: Appearance of fundus that of a myope, no recent changes. Discs, however, are only lightly tinted, verging on paleness, conus. Since then he has been observed off and on, but has had no return of glaucoma symptoms and no increase in myopia.

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TECHNIC OF TOTAL ECTROPION OPERATION.

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The operation here described uses Thiersch grafts applied to the raw surface exposed by freeing adhesions placing stitches in the margin of the lower lid attaching it to the region of the brow. An illustrative case was reported. Read before the Chicago Ophthalmological Society, February 15, 1926. See p. 629.

Of several methods employed in the reconstruction of total ectropin of the eyelids, probably the two most used by ophthalmic surgeons the world over are the Wolfe graft and the Thiersch graft.

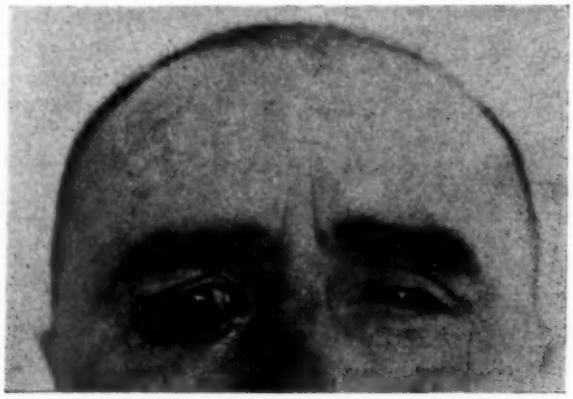

Fig. 1. Total ectropion of right lower lid before operation.

The Wolfe graft was not used in this instance, for the reason that it is a large, thick graft, composed of all of the layers of the skin; it does not closely enough simulate the appearance of the normal eyelid; has an enomous tendency to shrink; subcutaneous fat is apt to cause failure; the remaining defect from where the graft is taken is so great that it itself sometimes must be covered with other grafts, thus adding to the operation and further discomfort of the patient.

Employment of the Thiersch graft answers every purpose; it more nearly resembles the normal eyelid in appearance and function; it is obtained with less difficulty; leaves a smaller defect from where it is taken, and its take is as likely as the Wolfe graft.

Case: Male. Age 44. Laborer. Received a severe burn of the right eye October 4, 1924, while pouring molten metal. He was referred to us November 11, 1924.

Examination showed a total ectro-

Fig. 2. Appearance four days after operation for total ectropion.

pion of the lower eyelid, and a partial ectropion of the upper eyelid of the right eye.

On March 30, 1925, we sent him to St. Luke's Hospital. A general anesthetic was given, and the field of operation prepared in the usual manner. A cutaneous incision was made as long as the palpebral fissure of the lower eyelid two millimeters from and parallel to the margin; the parts were then undermined and freed of scar tissue, leaving a freely movable surface of mucous membrane and a healthy wound for the reception of the graft. Sutures were then inserted into the lid margin at regular intervals, which were used to bring the mucous membrane of the eyelid considerably beyond the eyelid of its fellow, to about the upper corneal limbus; they were then anchored to the forehead with collodion soaked cotton.

A Thiersch graft was obtained from the inner aspect of the arm and moulded into place, and kept applied by a thin sheet of cotton, *moist* with warm, sterile water. Two thin strips of adhesive plaster were then applied; these were overlaid with layers of cotton, between which were interposed perforated sheets of gutta-percha, and over all a creolin bandage. This made firm dressing, and prevented the possibility of any displacement. The dressings were kept moist with warm, sterile water, applied at intervals of six hours, for a period of forty-eight hours, then changed down to the first dressing and redressed as originally. Similar dressings were made daily.

All dressings and sutures were removed on the fifth day. The wound was then irrigated with warm, sterile boric acid solution, sterile vaseline inserted, and a bandage applied. This

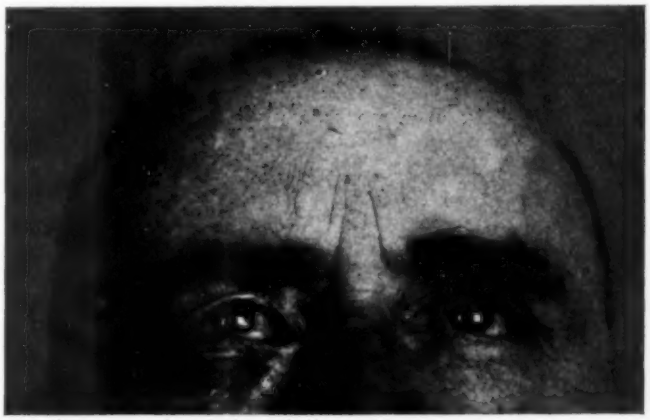

Fig. 3. Appearance four and one-half months after operation, eyes open.

Fig. 4. Appearance four and one-half months after operation, eyes closed.

was repeated daily for a few days, when all dressings were dispensed with. The patient left the Hospital April 17, 1925. He has a vision of 20/20 in either eye.

7 West Madison Street.

SURGICAL TREATMENT OF SQUINT.

JAY WEBB LOWELL, M.D.

CHICAGO, ILL.

An operation for squint should be planned to meet the exact conditions present as ascertained by accurate measurements. These are taken with a special instrument and locking tendon forceps are used to secure the definite amount of tucking or recession of a muscle. The technic of such an operation and its after treatment are described; and its advantages stated. Read before the Chicago Ophthalmological Society, February, 1926. See p. 527.

The surgical treatment of squint is a subject widely discussed and concerning which there are many diverse opinions. The fact that there are so many operative procedures suggests that few are uniformly successful. Most of these operations depend for their success to a large extent upon the surgical judgment of the operator. Therefore it is extremely difficult for him to impart his ability to others.

Primarily any operation which is successful in the correction of squint resolves itself into calculation of relative lengthening or shortening of opposing muscles, and then a method of applying these calculations to the muscles involved. Such an estimation may vary from cursory inspection to accurate measurement. Unquestionably most operators check the angle of the squint. Some of the popular methods apply the angular measurements thus obtained with accuracy to the operative procedure, but few consider checking the individual muscle efficiency. The good results are due frequently to a high degree of surgical judgment, rather than a preconceived plan of surgical attack based on accurate estimations carefully followed in the surgical procedure.

Dr. Edgar J. George originated and presented a method in which provision is made for the careful study and operation of squint cases. This method, because of efficiency, safety, and results has many points to commend it. Very briefly the treatment consists: first, of careful refraction; second, of a thoro study of the muscular balance of the eye; third, of a mapping out of operative procedure; fourth, of modified tucking and recession operation in which a predetermined procedure is followed.

The first consideration is outside the scope of this brief paper. The second, which is probably the most neglected, is of vast importance. If we knew exactly upon what point the eyeball rotated in the horizontal plane it would be a relatively easy matter to calculate how much muscle shortening would be required to correct a definite angular deviation. With this in view researches covering a period of several years were conducted. The author had the privilege of being associated very intimately in the work, the results of which were published in the Amer. Jour. Ophthal. (Oct. 1923.)

From this work it was determined that the center of motion was located roughly 15.4 mm. posterior to the corneal vertex and 1.7 mm. nasalward from the visual axes. These measurements are averages of a large number of individual cases and for practical purposes are sufficiently accurate. From them, computations of the amount of individual muscle shortening required to correct a muscular deviation were made. While computations are not difficult there is a physiologic element which must be considered and which we have been working on for some time. The results obtained in the cases to be illustrated are based on the assumption that 5 degrees of arc are equal approximately to 1 mm. of muscle shortening. We know that these figures are not exact but the results have been good and we are not in a position to publish or revise computations as yet.

Having established a point of rotation, and knowing how much muscle

shortening is required to move the eye a definite distance, the next consideration is a method of ascertaining the number of degrees each muscle, in an individual case, will turn the eyeball. We have a very elaborate specially constructed instrument called a strabophorometer by means of which very accurate measurements may be made, but for practical purposes the tangent scale tropometer originated by Nicati in 1876, and improved by Stevens, is quite satisfactory. By means of this instrument we are able to determine in which eye the defect exists, which muscles are involved and to what extent.

The patient is placed in this instrument with his head immovably fixed and, after adjusting the scale so the graduations are just tangent to the limbus, the patient is requested to rotate the observed eye nasalward and then templeward. It is quite necessary that these movements be the extremes of rotation. Our observations show that most patients are able to cover a span of 100 degrees of the tropometer scale. In this way not only the number of degrees of rotation nasalward and templeward are noted but also the muscle or muscles involved are located. It is quite true this requires the cooperation of the patient and is subject to error. The error may be ruled out by checking the observations several times on different days. Surprising cooperation may be obtained from even quite young patients.

A typical observation of a normal patient would show a movement of the eye 45-50 degrees both nasalward and templeward. These observations may be considered standard, and altho there are variations, they are not common. In studying the cases of squint it will be observed that the amblyopic eye is not always the one which has the entire muscular defect. The rule of always operating upon an amblyopic eye may lead one into operating upon an eye with a relatively normal musculature in order to coordinate it with a defective one. Usually the nonfixing eye has the greatest muscular defect but quite frequently both eyes are involved.

In addition to the cases which have only a muscular abnormality causing squint, we quite frequently encounter a combination of accommodative and muscular defects. These patients have much less squint when wearing glasses than without them. In these cases we have observed that the apparent angular deviation is frequently greater than the measurements of the muscular efficiency indicate. It is easy to imagine how difficult it would be to operate such a case relying upon measurement of angular deviation only.

In 1911 Dr. George devised and presented an instrument designed to permit the accurate readjustment of ocular muscles. This instrument consists of two locking tendon forceps which can be moved to include a definite amount of muscle when tucking. They can also be used to measure the amount of recession. While there are several other types of forceps available which can be used for this purpose, the above forceps appear to have advantages.

Now we come to the actual operation. Let us follow thru the case where we are dealing with a left convergent squint in which the defect was ascertained to be 20 degrees. We outline the operative procedure thus:

Right internal rectus to be tucked 4 mm.

Left internal rectus to be retarded 4 mm.

The patient is given a general anesthetic and the usual preoperative preparation. The tucking is always done first, the incision is made about 1 mm. posterior to the insertion of the rectus muscle. This is to facilitate the tying of the sutures and also their removal. This incision should be of sufficient length to permit ease in doing the operative work.

The muscle is picked up and the conjunctiva and capsule are carefully dissected from its surface. The dissection is carried only sufficiently far to permit required surgical work. Two right angled hooks are then inserted beneath the muscle and it is held up to permit the insertion of the tucking forceps. The utmost care must be observed to include all the tendon. The hooks are held by an assistant; one blade of the tucking forceps is applied as closely as possible to the insertion of the muscle.

The forceps are adjusted for the required tuck which in this case is 4 mm., then the second blade is clamped in place. The hook is now removed.

A double armed suture No. 4 twisted silk is inserted to include about a lateral one-third of the muscle, as close to the forceps as possible. A whipover stitch is made and then laid aside. Sutures are similarly inserted in the opposite edge of the muscle. Great care must be used not to lock this stitch. The end of the suture, which comes from beneath the muscle, is now passed beneath the blade of the forceps and thru the tendon insertion at about its middle. The other end is passed thru the tendon insertion near its edge. They are loosely tied and the same procedure is followed on the lower edge of the muscle. Both of these sutures pass thru the bulbar conjunctiva. This aids materially in their removal. The blades of the instrument are drawn together, a small right angled hook slipped between them, holding up the tuck while the instrument is released and the sutures are permanently tied.

All thru this procedure the forceps with their parallel blades were in place; eliminating the possibility of torsion due to an inequality of the recession of the two margins of the muscle. The conjunctiva and capsule are overlapped about 4 mm. and one or two sutures are inserted to hold them in place. The tucking sutures are not cut off but used as a guy to aid in picking up the opposing muscle.

A similar incision is made for the recession. The muscle is picked up and cleared as previously outlined. The forceps are inserted with one blade as close as possible to the muscle insertion. This blade is clamped in place. The forceps are adjusted for a separation of 1 mm., this is to permit cutting the muscle, then the second blade is clamped down. The same suturing method is used as when doing the tucking. The whipover stitch is inserted in each margin of the muscle. The sutures are then laid aside. The muscle is cut with very thin angular scissors. Care should be used to be certain that all the fibers are severed. The forceps are now adjusted so the muscle is retarded the 4 mm. The sutures are now inserted thru the muscle insertion as when doing the tuck. They are drawn up so they are firm and tied. The conjunctiva is permitted to gape slightly.

We have now done exactly what our investigation of the case indicated with an accuracy limited only by surgical skill. The lid margins are coated with yellow oxid ointment and cold moist applications are applied for the first 24 hours. No bandage is ever applied and the patient is permitted to go home on the second or third day. The superficial and retarding sutures are removed on the seventh and the tucking sutures on the fourteenth day.

There are four main points which commend this procedure: first, the safety of the method; second, the uniformly good results obtained; third, the ease with which children too young for local anesthetics can be operated; fourth, the short period of convalescence. None of the methods in common use are considered unsafe, but of all, tucking without the scleral fixation is the least likely to lead to difficulties.

I am presenting a series of 20 cases operated by Dr. George and myself. All of these cases show good cosmetic results. Several of them are cases with relatively high visual acuity in both eyes and some degree of binocular fixation. No difficulties have been experienced from diplopia, which could not be corrected by muscle exercise or prisms. The results have been permanent except in one case of our series where we operated two months after the patient had been subjected to unsuccessful surgical treatment by an unscrupulous physician. Our immediate surgical result was good. The patient returned home but at the end of nine months wrote us that the eyes were "crossing." After the usual check the case was reoperated. The muscles were found to have broad flat insertions with a surprisingly small amount of scar tissue. In fact, much less difficulty was experienced with the second operation than with the first.

We feel that when a case cannot be improved by other measures, and after the patient has reached six or seven years of age, the sooner he is operated on the better. I think all will agree

that such a child is much more easily handled under a general anesthetic. This procedure is admirably adapted to young patients because it does not require the cooperation of the patient during the operation. It is true that prolonged bandaging is not a serious drawback yet other things being equal a short convalescence has advantages, at least from the patient's point of view.

SUMMARY.

1. A definite procedure of examination with a localization of a muscular defect or defects is possible.
2. The amount of the defect may be measured with comparative ease and accuracy.
3. The results of such measurements may be directly applied in the form of a surgical procedure with a very high percentage of good results.
4. The surgical procedure is simple and safe and requires a very short convalescent period.

58 *E Washington St.*

MONOCULAR COLOR BLINDNESS.

WILLIAM F. BONNER, M.D.

WILMINGTON, DELAWARE.

Three cases of monocular color blindness here reported were found in examinations made for the U. S. Veterans' Bureau. In one the dominant eye was color blind but upon covering it he had normal color vision.

This report is based upon: 1. Rarity of occurrence. 2. Case reports showing three different types. 3. The necessity of examining each eye separately for color vision.

The only two references to monocular color blindness found in American medical literature, were those of Lt. Col. L. H. Bauer and Major William MacLake, M.C.,[1] in which they stressed the necessity for examining each eye separately for color vision in the Army Air Service, and Dr. J. E. Jennings,[2] who presented a case of "Monocular Color Blindness Noticed after a Blow on the Head," but in conclusion, he said that he suspected that the color blindness was congenital and that the traumatism brought it to the attention of the patient. Dr. Jennings referred to cases previously presented by Holmgren, Becker and Edridge-Green.

Case 1 was referred by the U. S. Veterans Bureau, because of poor vision in the left eye. The fundus details seemed absolutely normal and inconsistent with a vision of 20/200. Tests were tried for malingering without tripping him in his statements. One test tried was a sentence with red and green words alternating and having a red glass placed in front of the sound eye. He read only words in green, showing poor vision in the left eye. On examination with the perimeter, the field was found to be normal in the right eye and decidedly constricted in the left eye. Vision was not improved by refraction. Examination of the color vision showed normal color vision when using both eyes and with the right eye, but total color blindness in the left eye.

Case 2, also from the U. S. Veterans Bureau, was included in a previous paper on "Premature Presbyopia."[3] This patient had normal distant and color vision in the left eye, but needed correction for near vision. The right eye had a vision of 20/200 improved to 20/70 by a plus 3.75 Sphere. The fields of vision were constricted in both eyes, but more markedly in the right eye. This patient complained of the inability of seeing green with the right eye; greenish-yellow appeared as yellow, and greenish-blue appeared as blue. It was hard to call this a case of green blindness, because colors beyond the middle of the spectrum were visible. Edridge-Green[4] classified this condition as dichromic vision in which only the red and violet portions of the spectrum were visible. He presented a case of monocular color blindness of the same type. In speaking of this case to some artists, one suggested having a picture made representing this type of color blindness. He thought that it would be acceptable by one of the Paris Salons as a new art.

Case 3, also from the U. S. Veterans Bureau, had a vision of 20/100 in the right eye, improved to 20/40 by a plus 2.00 Sphere. The vision in the left eye was 20/40, improved to 20/20 by a plus 1.00 Sphere combined with a plus 0.50 Cylinder axis 180. The patient was a presbyope and obtained J3 by the addition of a plus 2.00 Sphere to each eye. The fields of vision were very constricted in each eye. This patient had poor color vision when using both eyes or when the left eye was occluded, but with the right eye occluded, he had normal color vision. This was explained by Dr. Burnett, Professor of Psychology at Bowdoin, who stated that the color blindness of the right eye, the eye of choice, affected the binocular color vision. Dr. J. E. Jennings' self recording color charts were used in each examination of the color vision.

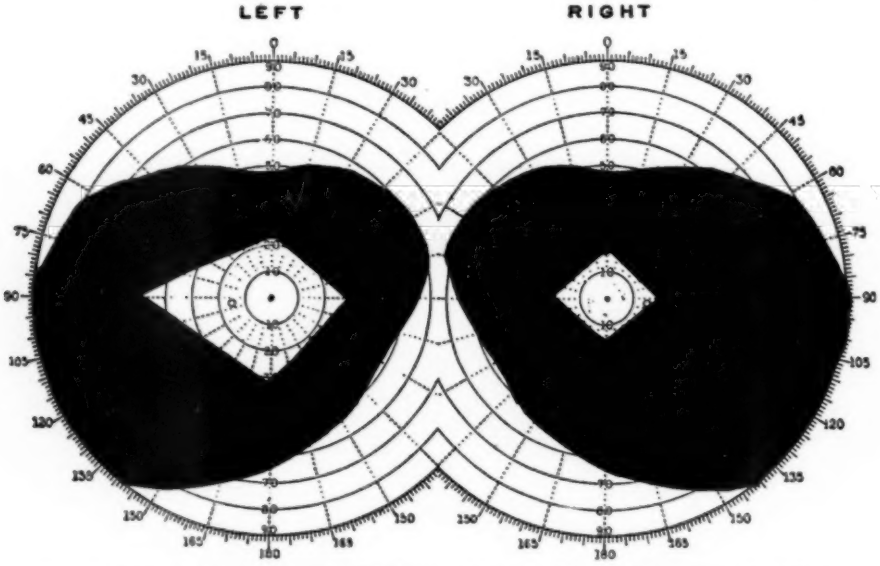

Fig. 1. Fields in monocular color blindness in Case 3. The right eye was color blind.

Examination of the color vision has been necessary in a number of occupations such as the Army, Navy, Merchant Marine, and the railroads, but the Army Air Service has been the only one that has required the examination of each eye separately for color blindness. A committee was appointed by the Medical Society of the State of Delaware to draw up requirements for the examination of paid automobile drivers,[5] which included the examination of each eye separately for color vision. This provision was discarded by the committee appointed by the Delaware Safety Council, because two of the members of the committee happened to be color blind and the Secretary of State of Delaware did not think that automobile drivers of that state would need to distinguish colors. The committee appointed by the Section on Ophthalmology of the A. M. A. rejected normal color vision as a requirement for automobile drivers, because three per cent of all men are color blind. Since the adoption in many cities of this country of the Crouse-Hinds system of colored lights for traffic control, it would seem that normal color vision is a requisite for safe driving in an automobile. As it is possible to have a monocular color blindness, which does not influence the binocular color vision and it is also possible to have binocular color blindness caused by the influence of one color blind eye, therefore the eyes should be examined separately for color vision. As most of the cases of binocular color blindness and all of my cases of monocular color blindness had other pathologic conditions, particularly constricted fields, the examination of the eyes separately for color vision should be included in all routine eye examination.

SUMMARY.

1. The case of monocular color blindness recorded have been very few.

2. Cases presented; a. Total monocular color blindness. b. Partial monocular color blindness. c. Binocular color blindness caused by color blindness of the eye of choice, but normal color vision in the other eye when the poor eye is occluded.

3. a. All occupations requiring normal color vision should have the eyes examined separately. b. Other pathologic conditions are often associated with color blindness, therefore color vision test should be included in the oculist's routine examination. c. Examination of automobile drivers for color blindness is necessitated by the use of colored lights as traffic signals.

224 Delaware Trust Bldg.

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MEMORIES OF VIENNA CLINICS.

PROFESSOR ERNST FUCHS.

VIENNA.

The Wiener medicinische Wochenschrift published a memorial number in honor of the seventieth birthday of Professor Friedrich Dimmer. This contribution from Prof. Dimmer's predecessor is translated by Dr. Hans Barkan, San Francisco.

As I had the pleasure, during the last years of my assistantship in the clinic of Professor von Arlt, to be a colleague of the man whose seventieth birthday we are celebrating, I may be allowed to recall to his memory some of the surroundings of our common working place in our youthful days.

The clinic at that time, it is true, did not appear as I had first known it. At that time I was a student of von Arlt's who then was the only professor of the subject. Only later was von Stellwag called as the second professor at the university. One entered at first the lecture hall which today as such does not exist. It was a long room decorated with pictures of the predecessors of von Arlt, of whom the first was Joseph Barth.

The University of Vienna had the honor to possess the first regular teaching post and clinic for ophthalmology in the world, the Empress Theresa in 1773 having appointed Barth as professor. Other chairs followed a long time after this. The great von Graefe was named as the first professor of Ophthalmology in Berlin only a few years before his death in 1866, and in Luttich (Liege) it took until 1881, the first incumbent of the chair being myself. Two etchings of von Barth hung in the lecture room. The one showed him in his younger years as an elegant Maltese nobleman with a feather in his hat; the other as an old miser. One tells the story that he then treated the Empress Maria Theresa and that on his departure the empress said "There, let him take this," and pointed toward a small purse in which his fee was contained. Barth took the purse, and with it, a small elegant and valuable table on which the purse lay, put them both under his arm and paid his respects. In addition to the etching of von Barth there were represented Beer, Rosas, Schmidt and others, and one painting of von Arlt which hung on a wall by itself.

Green colors were supposed to be good for the eyes. For this reason the doors and the benches of the lecture room were painted green. The clinic patients used green eye shields and green spectacles. In this lecture room there sat a small but reverent

body of busy attendants, and in the midst of them, upon a three legged stool, sat our master, who with us and before us, examined the ambulatory cases, busy in showing the case if possible, to each one of us. With this he directed questions to us, thru which an intimate contact between teacher and scholar developed, as is today, in consequence of the great number of pupils, unfortunately no longer possible.

In this clinic I started as an "aspirant" in 1873. At that time all drugs were still prescribed according to the old apothecary system. Of the alkaloids used in ophthalmology today, atropin only was known. Eserin, pilocarpin and cocain did not exist. The methods of the Medicina Crudelis were not entirely given up as yet, and his assistant at several times had to apply setons. This in one instance cured a case which I had thought incurable. An old woman had a particularly severe senile blepharospasm so that she for months at a time could not open her eyes and was half blind. After all other means had been exhausted I pulled a seton thru her neck at the orders of my chief. My first success resulted in erysipelas of the head, of which the old woman nearly died, but the blepharospasm vanished.

Eye operations were performed without anesthetic, for cocain was not known; and general anesthesia, which at that time was used in England for eye operations, was not used on the continent because of the fear of the consequent vomiting. We young assistants therefore had to learn to operate upon tender and therefore restless eyes, for which the preparation of removing foreign bodies from the cornea without anesthesia, was good preliminary training. As professor in Luttich I was still operating without cocain and can say that it went somewhat better than one would have expected. The incision into the eye was almost painless. On the other hand, the touching of a sensitive iris was very painful. The iris, therefore, at the end of an operation could not be carefully put into place, and the healing of an eye operated on for cataract, without some iris inclusion in the scar was a rarity.

The worst condition was the lack of asepsis. A few examples may show how little thought of asepsis troubled us. As students of anatomy in the fifth year, we often went from the autopsy room to the obstetric clinic, and proceeded to deliver babies with no qualms of conscience. When I was assistant of Billroth, it often happened that this conscientious surgeon, before attacking a difficult operation, went into the pathologic institute in order there to do the operation on a corpse immediately before trying it on the living.

Professor Dumricher lectured every Saturday about operative methods, in a lecture room where the corpse lay upon the same table upon which on the subsequent day the patient was operated. Von Arlt taught us to wipe Daviel's spoon between our lips before putting it into the eye in order that it be moistened and made somewhat slippery. The instruments were washed after the operation, not before. With all of this, the lack of asepsis was not felt as much in ophthalmology as in general surgery. Following iridectomy, infections of the wound were exceptional. Following the extraction of cataract, they occurred in eight to ten per cent of the cases. Such were the conditions in von Arlt's clinic.

There existed at the same time in Vienna an operator who seldom lost less than a half of his cataract eyes thru infection. That most operators, in spite of lack of asepsis, did not have worse results, lies in the peculiarity of operations on the eyes. After the incision which opens the anterior chamber, the aqueous gushes forth and cleans the wound thereby. The greater inclination to infection of cataract operations lies, not in the greater length of the incision, in comparison with that of iridectomy, but in the frequent lenticular remnants which form a good culture medium for bacteria.

The postoperative care of the patients could very nearly be called cruel. The room in which they lay was darkened and seldom was fresh air admitted. They had to lie for six days, scarcely moving, upon their backs, be-

fore they were allowed to get up. As the eye operations were mostly on older people, and upon men, often prostatic cases, pneumonia, and retention of urine were frequent complications. We assistants would then have to catheterize them, in which special act we were not exceedingly skillful. So that the patient held his breath because of pain, and pressed his eyes violently together, thru which act he more often ruptured his wound, than had he been allowed to get up in order to urinate. The hypostatic pneumonias were sometimes followed by sudden cases of death on first arising, as thromboses had formed in the leg veins and caused an embolism of the lung—the numerous preparations of eyes with fresh cataract operations which I possess, came from such unfortunate people. Senile delirium was often caused by the darkened room and the protracted bandaging of both eyes.

At that time in several of the larger cities of our provinces, as, for example, in Brunn, there were no eye specialists. As a consequence, the material of our clinics was very great, needing besides the professor, several assistants, and as many voluntary helpers as we could obtain. We worked from morning until night and could not have gone thru the material if it had not been that at that time many of the methods of examination which we now use were unknown. For instance, the existence of astigmatism was theoretically well known, but it was only at the end of my assistant's period that I corrected for the first, and also for the last time, to the astonishment of my colleagues, a high degree of astigmatism and obtained good vision, and was highly disappointed when the patient would not, under any conditions, even listen to the wearing of those spectacles. In the prescription of cataract glasses, no allowance was ever made for the often very pronounced postoperative astigmatism. Those, however, who had been blind before the operation were satisfied with a moderate amount of vision. After I had been "aspirant" in the eye clinic for a year I went for two years to Billroth, as von Arlt had the very sensible opinion that his future assistants should first be educated as general surgeons. My time of service with Billroth came perhaps at the most fruitful epoch of surgery, coincident with the introduction of antisepsis thru Lister. Lister himself came for several weeks to Billroth's clinic in order to show us his methods, and assisted for this purpose not only Billroth, but several of us younger operators. When I returned as assistant to von Arlt's clinic I brought antisepsis along with me. Von Arlt, altho aged at the time, could accept new methods, and willingly gave this one a trial. The spray could not be used as the eyes would not stand it, but the preparation of the field of operation, the sterilization of instruments and bandages, could be done, altho the cleansing of the hands left something to be wished for. However, this in eye operations themselves is not so important because the fingers should not touch the eye. It was at this period that Dimmer whose Jubilee we are celebrating, came from Prag to step to my side as second assistant.

Von Arlt had not an impressive appearance. He resembled a village teacher; and he was indeed an excellent teacher, of great powers of observation and of a natural common sense, and especially honorable and generous in his disposition; and, in spite of the high honors which he bore, an exceedingly modest man. He had been raised in very moderate circumstances, and his whole life long kept not only a simplicity of life, but an understanding for the problems of the poor. In the lecture room a blackboard stood upon a stand. Whenever von Arlt wanted to ask a patient a question of particular importance, he disappeared with him behind the blackboard, not only to ask the question, but in many cases to secretly press a bit of paper money into the hand of the patient. As an operator he was of high skill and operated as well with the left as with the right hand. But if colleagues from other countries who watched his operations expressed their admiration, he retorted only with the very simple remark, "To be a good operator does not mean scientific acquirements; you have to have the talent for a watchmaker."

NOTES, CASES, INSTRUMENTS

CONVERGENT STRABISMUS CHANGED TO DIVERGENT WITHOUT OPERATIVE INTERFERENCE.

GEORGE H. MATHEWSON, M.D.

MONTREAL, CANADA.

The patient is a young lady of some 31 years of age, and today when wearing her glasses shows a divergent strabismus of over 20°. On removing the glasses the divergence at once diminishes so that it is barely noticeable. The case gives support to Donder's theory.

I first saw her in 1900 when she was 6 years old. She was brought to me because she had a convergent squint, but on examining her I found her vision very poor; so poor in fact that when she dropped any small object she got down on the floor and felt for it with her hands. At this time she had compound hyperopic astigmatism of a high degree, 7 D. in the vertical and 11 D. in the horizontal merdian in each eye. I gave her + 6.00 s. ⌒ + 3.50 cyl. ax. 90° in each eye; which gave her 6/15 V. in each eye. When these glasses were worn the eyes were straight but convergent squint developed when they were taken off.

I saw her many times in the course of the ensuing 25 years; and, as time went on the astigmatism became less and the hyperopia greater, so that finally, in 1922, I gave her

R.+8.00 s.⌒cyl.+1.50 ax. 75°=6/12V.
L.+8.00 s.⌒cyl.+2.00 ax.105°=6/12V.

With both eyes this gave here 6/9 V. On this date it was noted that she had a divergent squint of 20° with the glasses on, when looking to the distance. But when she used the eyes for near work the divergence disappeared, as it likewise did when she removed her glasses.

An accommodative effort is involved in both the above actions so that we have here an additional proof of the theory that accommodation and convergence have the same or very closely connected central representation. That there must be at least one other factor besides hyperopia in the causation of convergent squint, most oculists are in accord, since we have all seen patients with much hyperopia and no convergent squint, and also myopes with convergent squint.

The sister of the subject of this note has nearly as much hyperopia but has never squinted. I have a friend and patient whom I have known for over 50 years, who has considerable hyperopia and one amblyopic eye, and who has never squinted. I have seen two myopes with convergent squint, in my clinic on the same day. Anatomic anomalies in the muscles, or perhaps nervous peculiarities, are probably the necessary complements required to produce overconvergence, while poor vision in one eye would tend to make that eye deviate rather than the other.

202 New Birks Bldg.

TERTIARY SYPHILIS OF EYELID.

EVAN S. CONNELL, M.D.

KANSAS CITY, MO.

It may be said that all cases of syphilis of the eyelid are unusual, because this disease rarely manifests itself by a lesion in this location. Zeissl[1] reported that of 40,000 cases of syphilis examined only eight had lesions of the eyelids.

The lesions of all three stages have been reported. The chancre occurs on the skin of the lids and on the conjunctiva, both palpebral and bulbar. Transmission is frequently by kissing. According to Fuchs[2] infection is conveyed to children by nurses, who sometimes moisten the agglutinated lids with saliva; and also by the practice of licking foreign bodies out of the conjunctival sac with the tongue. Secondary lesions of the lids have been reported in the form of papular syphilides and copper colored patches. Tertiary lesions are the rarest of all. The writer has been able to find but two types reported, viz., chronic tarsitis and gumma.

Fuchs describes tarsitis syphilitica as developing slowly and without pain. The lid is swollen and the skin is red and tense; the thickened tarsus can be palpated thru the skin. Gummata are very rare. Ulcers of the skin of the lids occur as a result of the disintegration of the chancre and the gumma. Ulcers also occur on the conjunctiva

and in this location are usually due to a disintegrating chancre. They may be situated near the lid border, in the retrotarsal fold, or on the bulbar conjunctiva.

The writer reports the following cases of nodular syphilide of the eyelid: Mrs. M. W. came to the eye clinic of the Richard Cabot Club on Feb. 3, 1926, because of a growth on the lower lid of the left eye. She gave the following history: White, married. Father died of influenza, mother died of "dropsy." She had a half sister who was paralyzed. Has had 5 pregnancies with one miscarriage; two dead children, pneumonia and whooping cough given as causes of death. There were nodular lesions involving the left lower eyelid, which were of two years' duration and had developed slowly and without pain. One nodule was just external to the punctum involving the free border of the lid and the entire thickness of the lid for ⅛ inch below the border. External to this and below were three other nodules involving the skin of the lid.

One year ago the nodule on the lid border had been mistaken for a chalazion, and incised and curetted. This incision healed and the nodule continued to slowly increase. Glasses had also been prescribed. The writer treated this patient's son in the same clinic for interstial keratitis one year ago. The blood Wassermann on this women was 4 plus.

The patient was referred to Dr. C. C. Dennie for a dermatologic examination. Dr. Dennie gave the following report, "These lesions are typical, ham colored, nodular syphilides. The nodules on the skin of the lid are three in number and grouped in the shape of a clover leaf. The outer nodule is on the border of the lid and involves the entire thickness of the lid. Diagnosis: tertiary lues of the eyelid—nodular. type."

The patient was placed on antisyphilitic treatment with prompt reduction in the size of the lesions.

607 Commerce Bldg.

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3. Heckel and Beinhauer. Arch. of Ophth., v. 54, p. 352.
4. Syphilis of the Eyelids. Am. Encyclo. of Ophth., vol. VII, p. 5025.
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SIDEROSIS OF THE CRYSTALLINE LENS.

Dr. G. N. Brazeau.

MILWAUKEE, WISCONSIN.

A man of twenty-four years of age consulted me in August, 1925, as to the probable cause of the blindness in his left eye. The history of the case is as follows: In February of the same year he had an intraocular foreign body removed from his right eye and thought his present trouble might be due to this. He claimed that the left eye had always been good and that it never had been injured. An X-ray examination made of both eyes at the time of said injury revealed the presence of an intraocular foreign body in the right eye but none in the left. Both eyes appeared normal externally save for the presence of a complete cataract in the left eye due, to all appearances, to an injury by a piece of metal which penetrated the lens, either without the patient being conscious of such injury or, if he was, he denied it in furtherance of his claim for compensation. In corroboration of my belief in such injury, I found a yellowish spot in the center of the lens. On dilating the contracted pupil which by the way dilated only partially tho uniformly under atropin, I discovered a complete circle of spots like the central one situated midway between the center of the lens and its periphery, which v. Graefe thought was greatly presumptive of a metallic foreign body within the lens. While the imperfect dilation of the pupil still remains a puzzle to me, its uniformity of contour proved the absence of any posterior synechiae. My opinion was that here was a posttraumatic condition very probably due to penetration of the eyeball by a piece of metal that found lodgement in the lens where it underwent complete dissolution and deposited in the form above described. This deposition of iron salts in the tissues is what Bunge in 1890 termed siderosis. No trace of the

passage of the metal in the eye being discernible, it is more than probable that the point of entrance was thru the periphery of the cornea and the iris where the capsular wound could easily be concealed and closed by the undilated portion of the iris. That the wound was small and closed immediately was evidenced by the fact that the very little absorption of the lens substance that occurred was unaccompanied by any noticeable reaction in the eye. Because of the great tolerance of the lens to foreign bodies such absence of symptoms of reaction argues in favor of the lens as being the probable site of lodgement of the metal. These lenticular changes are also found whenever the metal is in the vitreous in the neighborhood of the lens in which case, the iris is also often pigmented (Berlin, Landemann), the iron penetrating the lens by diffusion thru the capsule in the form of bicarbonate of iron which later on precipitates in the form of hydrated oxide of iron. Proofs of this were given by Leber who treated the pigmented parts of extracted lenses with yellow prussiate of potash and nitric acid, the result being Prussian Blue. E. von Hippel arrived at the same conclusions; that the pigment spots were exogenous in origin in these cases. Coloration of the lens occurs most readily in the following order respecting the position of the metal: the vitreous, the lens, and the sclera. (Berlin, Leber.) Bettremieux, in a case of xanthopsia accompanied by an intraocular hemorrhage, reported that white appeared yellow even after the vision had returned to normal. Siderosis soon developed with opacity of the lens and the vision was lost.

References quoted above were taken from the French Encyclopedia of Ophthalmology, Graefe-Semich Handbook of Ophthalmology.

Copper, ordinarily so poorly tolerated by the vascular tissues of the eye, where it almost always causes inflammation and suppuration, is, on the other hand, fairly well tolerated by the lens (Leber). Kostenitsch, Schmidt. and Wagenmann demonstrated that both copper and iron could be dissolved in the lens and produce siderosis therein. Siderosis is inoffensive as regards the eye and cases of recovery have been reported. Formerly Hirschberg and his pupils maintained that beginning siderosis, in an eye in which the metal was allowed to remain, spelled doom to the eye. This case proves the contrary for the metal was never extracted.

It is rather infrequent to find siderosis confined to the lens alone. It is my belief that in this case the foreign body found lodgement near the central pigment spot within the lens. The intolerance of the eye toward foreign bodies is well known and it is almost the exception when symptoms of reaction do not supervene whenever one foreign body is allowed to remain in the eye, unless the metal is embedded in those tissues more or less tolerant of it, e.g., the lens, or the sclera. Statistics show that about 62% of all intraocular foreign bodies are composed of iron; 5% of them lodge in the lens; 30% of the latter end in loss of the eye (Weidemann Thesis at Zurich, 1895).

This proportion of loss has been lowered since adopting the custom of washing out the anterior chamber with boric acid as is now done at the Zurich clinic. Rauschenbauch in 1897 claimed that in 91 cases of traumatic cataracts 40% retained about 1/10 vision; the younger the patient the better the prognosis. Since adopting the above custom 25 cases recovered without complications, 20 of them had 1/10 vision. Mackenzie, in examining 50 cases operated on at Moorfields at London, found 10 situated in the cornea and iris, 12 were in the lens and 28 in the vitreous. Of the 12 with traumatic cataracts in 3 the vision equalled 1/3 or over, in 4 V. = 1/3 or less. In one case the eye had to be enucleated. In 3 the vision was not noted. As to those in the vitreous 3 out of 28 gave satisfactory vision, 20 were lost, and of these 19 had to be enucleated. The foreign body in this case was probably small and so was the quantity of its salts. This may in a way explain why the siderosis was not more extensive than it was. What starts corrosion of metal in the eye in some cases and retards it in others are mooted questions.

700 Majestic Bldg.

SOCIETY PROCEEDINGS

THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

The Annual Congress.

April 29th, 30th, and May 1st, 1926.

SIR JOHN HERBERT PARSONS, C.B.E., D.Sc., F.R.S., President.

Progress of Ophthalmology.

The PRESIDENT devoted his address to an account of the progress of ophthalmology and the part played by the Society in that progress, as well as the hand he hoped the Society would take in future advancement. He said that advances in biology must necessarily lag behind those in physics and chemistry, as biologic processes depend fundamentally on physico-chemical processes, a fact which most psychologists failed to take sufficient note of. Medicine was now gradually emerging from the dominance of empiricism and metaphysic speculation, but, owing to the fundamental constitution of human nature, it could not be expected to ever rank as a pure science. Medicine dealt with the preservation of life, and this was more important even than the acquisition of wealth. There was, therefore, a tendency to take short cuts in medicine. Yet there was no royal road to scientific certitude. Confronted with disease, a man's eagerness to get well led to his clutching at any straw, so that he still remained under the subtle witchery of the quack and the charlatan. It was the duty of this Society to wage war against this quackery; but it must be done without feelings of self glorification, for in the practice of medicine there was an empiricism which was legitimate. Sometimes, he said, too narrow a view was taken as to the scope of ophthalmology; it did not sufficiently include the ways in which ophthalmology impinged on public life, nor how advances made in other sciences could be applied to this.

Among the efforts which had been and were being put forth to better the conditions of the working community, there naturally arose ophthalmic problems, such as those concerned with illumination and fatigue, but only a few of these could be solved without research. He referred with satisfaction to the labors of the Medical Research Council, especially in regard to the legibility of types, the effect of flickering lights, light therapy, and the importance of illumination in industry. This last had been dealt with by the Department of Scientific and Industrial Research. There seemed to be a difficulty in finding sufficient workers qualified to undertake these researches, The President, therefore, appealed to members to encourage clinical assistants and others to equip themselves to carry it on. As an example of his meaning he referred to the effect of light therapy in certain disease conditions.

The average text-book, as well as the curricula, fostered the erroneous idea that ophthalmology was a narrow and sharply delimited field of work. As a receptor organ, the eye could only be adequately studied as an integral part of that varied receptor apparatus which was the gateway of perception. Adequate stimuli to the eye included waves of lengths which, in some cases, possessed deleterious properties when applied to living tissues, such as those of the retina. A warning as to this potency was needed, especially now that light therapy had been added to to the medical man's armory and was being applied by medical men who seemed ignorant of the properties of light.

Touching on another aspect, the President said it was lamentable that the pretentions of a relatively small (but influential) group of "sight testing opticians" should preclude ophthalmologists from taking part in collaborating with those who were devoting their lives to optical investigations. Still, Sir John did not regard the problem presented by the sight testing opticians as insoluble.

Stimuli impinging on receptor organs set up nerve impulses, and there was evidence that these impulses were the same in type wherever they originated, whether in eye, skin, muscle, or the central nervous system, and oph-

thalmology should take cognisance of them all.

In conclusion, the President declared that the bane of specialization was isolation, and its cure was cooperation. He hoped the Society would continue to contribute worthily to the repair and improvement of the great edifice which, erected by their predecessors, had been handed down to those who now formed its membership.

MR. J. H. FISHER thanked the President for his address, in a felicitous speech, in which he paid a tribute to the learning and distinction of Sir John Parsons, and sounded a note of regret that Sir Anderson Critchett was now no longer among them to propose this appreciation in his matchless way.

DR. G. MACKAY seconded, and it was cordially passed.

Observations on Color Vision.

PROF. H. E. ROAF gave a lantern dissertation on this subject, remarking that he has been interested in the question of vision from the biochemical point of view. He felt that in investigation could usefully be made as to the way in which radiant energy was transformed into nerve impulses. In what way was color vision related to the wave length of light? The physiologic text-books treated that subject in a short and not very satisfactory manner. It was necessary to look for some sort of transformer in the retina itself. He first got a color blind person to copy a color diagram, simply using a box of ordinary water colors. On looking thru a blue glass, the normal person made the same errors as did the color blind person. An analysis of 28 cases showed that the defect was invariably in the red end of the spectrum, i.e., the color blind person did not distinguish the red rays from the rays from other parts of the spectrum. By cutting out the red end of the spectrum, most of the mistakes disappeared. The person who was said to be color blind was not so in reality; he could see the light, but in many cases he failed to distinguish it. The sensitivity of the color blind person to the red end of the spectrum he found to be the same as that of the normal person. In making his tests he had to adjust the intensity of the light so that it was approximately equal for all parts of the spectrum, as otherwise, the person tested judged by the comparative luminosity. Unless radiant energy was absorbed it would not stimulate the nerves, tho it did not follow that all the light absorbed would stimulate. He thought one should look to the cones for the differentiating mechanism. For example, if there was a cone which perceived red light, it might preferentially absorb red rays. No man had seen anything of the kind in the human, but in the cones of birds and reptiles and amphibians there were colored globules, and they were at the junction of the cone and the cone body. That was known by Helmholtz, who mentioned it as a possible explanation of color vision. If color globules could be found in the human eye, that would explain many of the happenings in regard to color vision. He concluded by dealing with the question of visual fatigue.

Discussion. DR. G. MACKAY spoke of the new test for Daltonism which had been devsed by Schaaff, of Strasbourg, much on the same lines as those of Ishi-Hara. He also raised the question whether the perception of color was a question of the retina at all; whether it was not, ultimately, a matter of the function of the nerve cells in the cerebrum.

THE PRESIDENT spoke of the variation in the exact shade of color when produced by lithography, a variation depending on the stage at which the printing was done. The adoption of colored glasses was started by Abney many years ago. It was evident that in all varieties of color blindness there were large ranges, and the tester could only get a rough approximation of what the patient actually saw. He had been agreeably surprised to hear a physiologist's good word for something which came under the trichromatic theory. That was of value as a hypothesis, and the only value of a hypothesis was its capacity to explain such facts as were known, and it capacity for originating new experiments.

Value of Collective Drawings.

MR. RAYNOR D. BATTEN read a paper entitled "The value of collective draw-

ings of diseases of the fundus as an aid to research." He showed a large number of drawings, made by Messrs. Hamblin, illustrating different stages of eye disease, and various eye diseases, and indicated the value of these in contrast to the memory or dependence on a rough sketch. Subsequent speakers discussed the desirability of having a curator to look after such drawings.

Recovery from Chronic Glaucoma.

MR. GEORGE YOUNG read a communication on a case of recovery of vision in a patient whose glaucoma reduced vision to perception of hand movements. The patient was a lady aged 71. It was chiefly brought about by the administration of pilocarpin aided at a later stage by a sclerectomy in both eyes.

Orientation in Lateral Diplopia.

MR. G. F. ALEXANDER read this paper in which he enunciated a number of laws.

Intra- and Extraocular Melanomata.

MR. G. W. SPENCER opened with a treatment of the subject from the general aspect. He said that melanomata, pigmented nevi or moles were either developmental defects, or acquired new formations which, for a time benign, underwent slow changes which ended in malignancy. Melanin was now recognized as being directly connected with a disturbance of cell metabolism. Melanomata which commenced in the eyelids and conjunctiva had similar characters to those of the skin generally, and were amenable to the same treatment, i. e., excision before the onset of malignancy. The intraocular melanoma was beyond the control of surgery. Even removal of the affected eyeball did not prevent the ultimate death of the patient from generalized cancer. He discussed the origin of malanin, and the probable mode of development of melanotic cancer, and said nothing had been done of benefit to these conditions except by surgery: neither radium or roentgen rays had been of any use.

DR. ARTHUR WHITFIELD discussed these growths as they occurred in the skin, namely, cellular nevi. These were of two kinds: papillomatous outgrowths, chiefly formed from the spinous layers of the epidermis, and those in which masses of cells were found lying in the true skin, which turned out to be lobulations of growth in the true skin. The change was most marked at the base of the interpapillary epithelial ridges, with a simultaneous solution of epithelial fibrils. He did not regard the production of pigment as an essential part of the nevus. He considered that there was a solution of the prickles between the cells, so that they lost their structural continuty and formed a part in which the lacunae got swept off into the true corium. Ordinary Paget's disease he regarded as malignant from the start. When a melanotic growth was removed and submitted to one for examination it was very difficult, often, to say whether it was malignant or not.

MR. TREACHER COLLINS showed on the screen a number of drawings of intraocular melanomata, both innocent and malignant. The conclusions at which he had arrived on the subject he summarized as follows: That in the normal tissues of the eyeball, melanoblasts are both epiblastic and mesoblastic in origin. That in the iris, innocent melanotic growths may arise from both epiblastic and mesoblastic tissue. The innocent epiblastic melanomata may appear at the pupillary margin and be either cystic or solid. They may also extend into the stroma from its posterior surface. The innocent mesoblastic melanomata may be either localized or diffuse; they are due to hyperplasia of the surface endothelium, or a formation of clump cells, or both combined. Clump cells, he said, are chromatophores in which the branching processes are retracted into the body of the cell, and where the melanin granules are concentrated.

Malignant growths may start from these innocent mesoblastic melanotic growths, and consist of splindle shaped cells and clump cells. Metaplasia of endothelial cells into spindle shaped cells takes place both in the normal development of the eye, after traumatic lesions, and in connection with malignant neoplasms. Innocent melanomata of mesoblastic origin, similar to those occurring in the iris, are met with in

the ciliary body and choroid. Malignant mesoblastic melanomata of the ciliary body and choroid may be classified as follows: (1) Interfasicular endotheliomata, (2) peretheliomata, (3) sarcomata arising in the cells proper of the choroid. Malignant melanotic epithelial growths may, in rare instances, originate from the pigment epithelium of the ciliary body, and possibly also from the pigment epithelium of other portions of the uveal tract.

Mr. Affleck Greeves showed and demonstrated a number of microphotographs of growths under discussion, many of them having been taken by the late Mr. Coats. One was a pseudomelanoma of the iris in a woman aged 32, who complained of mistiness of vision. A dark brown spot was found at the peripheral part of the iris, and the pupil was flattened opposite the tumor. There were a few spots of keratitis punctata, and some vitreous opacity. At a meeting of the Society the general opinion was that it was a malignant growth, and the eye was accordingly excised. Microscopic examination, however, showed it to be inflammatory, the tumor consisting entirely of epitheloid and inflammatory cells. It was a gumma of the iris. The Wassermann reaction was positive, and three of her children gave a positive reaction too. It was the only case of pigmented gumma of the iris he had been able to find a record of. Nevi of the conjunctiva, when they became malignant, behaved as carcinomata, invading neighboring lymphatic glands.

Mr. R. Foster Moore spoke of innocent pigmented growths of the choroid. When small, these were often overlooked on ophthalmoscopic examination. These were either congenital or developed quite early in life. Seeing that they had been watched for years without undergoing any alteration, he did not think they could be regarded as malignant.

Dr. Houwer discussed a case of extensive sarcoma in the sclerotic and whether it originated in the outer or the inner side of the membrane. It was, he said, easier to suppose the tumor originated in the outer layers of the sclera, causing a large intraocular tumor, and then infiltration of the sclera, and afterwards it turned into the choroid. If the eye had been enucleated some weeks later there would have been a large flat tumor which would have been diagnosed as a flat melanoma. These flat ones, he said, did not grow rapidly. A resemblance to flat melanoma might be caused by a confluence of a number of tumors.

Mr. Richardson Cross spoke of a very interesting case of melanoma of the caruncle which grew from the edge of the caruncle and plica. It lay along the surface of the palpebral conjunctiva as if it had been laid on with a paint brush. The man had made no complaint of it, he had simply come for glasses. The growth had been present four years; vision was perfect. The President, who saw the case, agreed that a pigment spot there was a dangerous thing, and the speaker accordingly did a very radical operation. The patient remained well for four and one-half years, but at the end of that time there was some inflammation, and a gland was noticed at the angle of the jaw, so that obviously there was a recurrence, and tho there was no pigmentation and nothing could be seen on the eyeball, he felt sure there was some solid mass there. The orbit was thoroly eviscerated. The specimen, which he exhibited, showed that the growth was melanotic sarcoma, and it was well encapsulated.

Comparative Brightness Value of Two Eyes.

Mr. J. H. Tomlinson at the Friday morning session, read a further note on comparative brightness values of two eyes and a single eye, and demonstrated his method of testing for this. With two eyes the brightness value was 113 in comparison with 100 with one eye. The mean of a large series of observations gave 115:100.

Value of Ultraviolet Light in Certain Eye Diseases.

Mr. Charles Goulden (Secretary of the Congress) said that ultraviolet light was obviously a means of curing one disastrous eye disease, namely, tuberculosis of the iris and ciliary

body. A typical case among those he related was the following, of tuberculous iridocyclitis. A boy aged 6, had been under care since 1923. He was very delicate in appearance, and the left eye had been inflamed many weeks, and he had not had any adequate treatment. There were waxy corneal precipitates and sclerosis of the peripheral parts of the cornea, extensive posterior synechiae, and an exudate in the pupil. The tension was not raised, vision was not more than perception of hand movements. The right eye was healthy In the neck were many enlarged lymphatic glands. The Wassermann was negative, and there were no signs of congenital syphilis. Still, he had the usual local remedies, and a course of injections of novarsenobillon, and the tonsils and adenoids were removed. After many months of treatment in hospital and convalescent homes the eye became larger, and was removed. Two months later the right eye showed commencing iridocyclitis. The boy was at once admitted to hospital, and in addition to the ordinary local treatment, tuberculin was used. Still, the eye degenerated and became soft. As a last resort, ultraviolet light baths were commenced in May, 1924, and the effect of them, Mr. Goulden characterized as miraculous; the eye began to improve in vision and appearance, the enlarged lmyphatic glands in the neck became smaller, and now the vision was 6/12, and the boy could read ordinary print. Apparently, the eye was now free from active disease. He had had no local treatment for the past eight months. Phlyctenular disease was also greatly benefited by this treatment. He was not able to give a good account of the result in episcleritis, sclerosing keratitis, or chronic iridocyclitis. He suspended judgment in regard to central retinitis and subretinal exudation.

Discussion. MR. W. S. DUKE-ELDER read a communication on the same subject, and his results were very similar to those of Mr. Goulden, results which were confirmed by the President, in one case of iridocyclitis especially, which he got Mr. Duke-Elder to treat in this way.

DR. W. O'DONOVAN supported what Mr. Goulden said from the standpoint of the dermatologist. It was of especially marked benefit in lupus.

Siderosis Bulbi.

MR. M. S. MAYOU read a recondite paper on this subject, supported by some fine photographs and colored drawings.

Discussion. MR. J. F. WARD, who examined Mr. Mayou's specimens, suggested that the iron was circulating round the epithelial cells in a molecular state, and it diffused thru. Then, by reacton of the cell content, the iron assumed the colloidal state, and so the metal could not pass out again. Only a small portion of the deposited iron passed into molecular solution and passed out again, but if the infecting source were removed, in time the whole staining would disappear. Other members discussed the paper.

Senile Macular Exudative Retinitis.

MR. R. DAVENPORT presented a paper on this subject. It dealt with four cases especially, which he intended to show at the clinical meeting. None of the patients had retinitis proliferans. Blood pressure varied from 148 to 240. Most of the patients he had seen with the condition had no albuminuria, but in some, arteriosclerosis was definitely present. He gave an epidiascope demonstration of some of the appearances in this disease.

Diseases of the Macular Region as Seen by Red Free Light.

MISS MARGARET DOBSON claimed that many conditions, tho visible with the ordinarily lighted ophthalmoscope, were much more clearly seen and more certainly recognized with red free light.

MR. MAYOU and MR. HARRISON BUTLER, tho the latter agreed with some of Miss Dobson's contentions, were not so enthusiastic as she showed herself. Mr. Goulden, on the other hand, regarded red free light as a great help.

On Friday afternoon a large number of clinical cases were shown by Mr. Foster Moore at St. Bartholomew's Hospital and they were afterwards discussed in the library of that historic institution. Chief interest centered round a case of rodent ulcer of the in-

ner angle of the eye which had been treated somewhere by radium. As a result, the surface of the growth seemed to have improved, but it was found at a later stage, when surgery was used, that the boring of the growth inwards had persisted, and the question now arose whether the orbit ought not be exenterated. Practically all the speakers who referred to the case deprecated the use of radium for this condition, and advised the complete emptying of the orbit in this case.

Birth Injuries of the Eye.

DR. COMYNS BERKELEY opened the subject as an obstetric physician, and raised the question as to how many disabilities of the eyes, called congenital, were due to injury inflicted on them during the process of birth. His experience of thirty years had led him to the conclusion that injuries to the eyes as a result of labor was very rare. In saying that, he admitted he did not examine infant's eyes with the ophthalmoscope. He quoted a series of statistics by different workers, giving greatly varying percentages of eye injuries at birth. He was, himself, averse to the use of instruments at birth if they could be done without.

The subsequent discussion was carried on by Mr. Ernest Thomson, Dr. Leslie Buchanan, Mr. F. A. Juler, Mr. A. S. Ormond, Mr. J. Rowan, Mr. Treacher Collins, Dr. Ballantyne, Mr. Harrison Butler, Dr. Whittington and the President.

Optic Neuritis in a Pedigree Bull.

MR. A. F. MACCALLAN and MISS IDA MANN read a paper on this subject. Until 8 months previous to the examination the bull's sight had been good. When seen at the Royal Veterinary College both pupils were dilated and immobile. A small hemorrhage was seen, but no other deviations from the normal. There appeared to be only bare perception of light. The brain, owing to an oversight, was not preserved after the bull was slaughtered. Miss Mann found that the disc was swollen and there was a large round celled infiltration; the swelling was due to edema rather than to acute inflammation. The physiologic cup in this specimen was filled, and the central vessels were widely distended, especially the vein. No thrombosis could be found. Far back the optic nerve was normal. She gave a minute description of the pathologic findings. The case was discussed at some length.

Fincham Slit Lamp.

The remainder of the time was occupied by a description of the Fincham slit lamp by Mr. Fincham, and a demonstration of beautiful slides of eye structure, as well as some observations by the same gentleman on the accommodation of the eye. A free discussion ensued here also.

On Thursday evening members dined together, and in connection with the Congress a remarkably good collection of instruments used in the specialty was crowded into the limited space, and demonstrated by representatives of the respective firms.

HENRY DICKINSON, Reporter.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Section on Ophthalmology.

February 18, 1926.

DR. EDWARD A. SHUMWAY, Chairman.

Bilateral Uveitis with Complicating Cataracts.

DR. BURTON CHANCE and DR. H. J. BLACKMON presented a case of bilateral uveitis which began in November, 1924, with gradually failing vision in each eye and recurring attacks of pain and redness. For the past three months the patient has been unable to see well enough to get around.

Examination of the right eye shows an organized exudate with considerable vascularization in the lower part of the anterior chamber. This exudate is about 4 mm. wide below. The iris is attached to the exudate posteriorly. There are evidences of old iritis with complete annular synechia. The lens is completely cataractous.

The left eye is similar except for numerous, isolated, grayish deposits on the entire posterior surface of the cornea. Also, the organized exudate is less and the iris is less adherent.

The tension in O. D. is 8; in O. S. 11. Light projection is good. The blood pressure 150/88. Nose and throat examination shows bilateral purulent ethmoiditis. Other findings are negative, including the Wassermann. However, he was under specific treatment for several months before admission. Cataract extraction is to be done on the left eye within a few days.

Paralysis of the Inferior Oblique Corrected by Tenotomy of the Superior Rectus of the Other Eye.

DR. WM. ZENTMAYER exhibited a case of isolated palsy of the inferior oblique muscle of the right eye, referred to him by Dr. C. P. Franklin of the Veterans Bureau, upon which he had performed tenotomy of the left superior rectus for the correction of diplopia.

He pointed out that this was a procedure recommended years ago by Mauthner but that Landolt adhering to his preference for advancements in all ocular muscular anomalies, advises advancement of the inferior rectus muscle. As is stated by Duane, the inferior oblique of one eye and the superior rectus of the opposite eye are complete physiologic associates. The left superior rectus and the right inferior oblique have a common field of action, the left upper quadrant. In this common field, and elsewhere too, the inferior oblique moves the right eye up in precisely the same way and nearly to the same amount that the superior rectus moves the left eye. Each acts to move the eye up, each rotates the eye slightly to the right, each tilts the vertical meridian to the right, and the elevating power of each increases as the eyes are carried to the left. The lateral and torsion action of both muscles increases as the eyes are carried to the right and decreases as they are carried to the left.

In the present case there has been a slight overcorrection of the defect, as evidenced by the fact that the secondary deviation has been transferred from what was the sound eye to the affected eye. There is, however, no spontaneous diplopia, but it can be elicited with a red glass, and the corneal images are symmetric in all the fields of regard.

Discussion. DR. LUTHER C. PETER stated that the operation which Dr. Zentmayer performed on this patient is the logical operation to correct the diplopia and relieve the patient's discomfort. Duane has demonstrated the value of operation on the associated muscle in paralysis of one of the vertical group. As Dr. Zentmayer has pointed out, the action of the superior rectus of the left eye is, in all respects, similar to that of the inferior oblique of the right. One would naturally expect, however, an overcorrection from tenotomy of the superior rectus muscle. While the inferior oblique has considerable power as an elevator, its elevating action is not equal to that of the superior rectus. This is due to the difference in the attachment of the superior rectus from that of the inferior oblique, forming an angle of about 23 degrees with the antero-posterior axis of the eyeball in contrast to an angle of 39 degrees for the inferior oblique.

DR. WARREN S. REESE recalled that he had exhibited this patient here three years ago as a case of anophoria. From a rough examination at the present time, this condition apparently still obtains, altho, as Dr. Zentmayer states, the left eye is not so markedly up under cover as before operation. There was formerly a marked rotatory movement of the right eye when uncovered. This has also been much benefited. Judging from his cursory examination, he believed that there was still a right hyperphoria when the Maddox rod is over the right eye, and a left hyperphoria when the Maddox rod is over the left eye.

DR. EDWARD A. SHUMWAY said that he had reported a case of traumatic paralysis of the left superior oblique, which had been cured by tenotomy of the right inferior rectus muscle. Landolt's dictum had always been to advance the corresponding superior and inferior rectus muscle in these cases, but their position made advancement more difficult, and, as very good results were secured by tenotomy of the opposing muscle, this was usually the operation of choice.

DR. ZENTMAYER, in closing, said that the operation of tenotomy of the inferior rectus for paralysis of the superior oblique of the opposite eye is probably more often performed. He recalled the first case he has seen so corrected, the operation having been performed by Dr. Norris. He, himself, had done the operation three times, twice for diplopia following a Killian operation, and once for a separation of the pulley of the superior oblique from a blow on the orbit, the diagnosis having been correctly made by a physician, Dr. Crabtree, who sent the patient to the hospital.

He said that Dr. Norman Risley had also presented a case following a Killian operation.

He could not quite understand Dr. Peter's statement that the inferior oblique has less elevating power than the superior rectus because, if this were so in their common field of action, the upper outer quadrant, there would be diplopia.

Simplified Method of Complete Enucleation.

DR. FREDERICK KRAUSS read a paper on this subject published in full p. 591.

Diabetics and Tobacco Amblyopia.

DR. G. E. DESCHWEINITZ and DR. A. G. FEWELL, after some reference to the well known vulnerability of the optic nerves of diabetics to tobacco, and after summarizing the case histories of several patients with diabetes, who also were excessive smokers, and whose visual charts interpreted a chronic axial neuritis in which tobacco toxemia was evidently the prime factor in its development, endeavored to show how these scotomas differed from those which were caused alone by the diabetes.

Their charts, which portrayed the "distinctive features" of the tobacco scotoma clearly, showed how it differed from that which was occasioned by diabetes alone, the patients being nonsmokers and abstainers from alcohol. They also pointed out that even moderate smoking in diabetics was harmful, as Leber long ago contended. They emphasized the importance of warning diabetics of this danger, and their cases indicated how failure on the part of the medical attendants had been responsible for an amblyopia which otherwise would have been avoided. Altho a true diabetic amblyopia occurs, it is not a common condition, and in the majority of instances the axial degeneration is caused by tobacco or alcohol. The optic nerve being sensitized to tobacco by the diabetes. They also exhibited a series of field charts in cases of tobacco amblyopia unassociated with diabetes and demonstrated how exactly they conformed with those of the diabetic patients who were smokers and who had acquired a so-called central amblyopia.

Discussion. DR. LUTHER C. PETER observed that many points of interest might be discussed in this very excellent presentation of Dr. deSchweinitz', first, that of the predominance of the blue pericentral scotoma. There is a relation between the loss of blue and choroidal nutrition of the outer neuron of the retina, loss of red and green being especially identified with the transmitting part of the neuron or nerve fibers themselves. When there is a preponderance, therefore, of a blue scotoma, one would naturally think of nutritional disturbances rather than a pure toxic amblyopia.

Second, the differences in results as to the size and shape, extent and saturation of the scotoma in toxic amblyopia, are due largely to inaccuracies in field taking. It is most difficult to map out a central scotoma, but, with the modern refinements, we will probably arrive at more uniform conclusions. The hand campimeter is an excellent instrument with which to pick out the scotomas, but he believes the Lloyd Slate is probably a little more finished in working out the refinements.

He believed that the differentiation which Dr. deSchweinitz made in reference to the peripapillary and caecocentral scotoma was very important. The caecocentral scotoma indicates involvement of the papillomacular bundle. Dr. Peter had never seen, in his studies, a single case of toxic amblyopia which was due solely to tobacco, altho in England it is claimed that many cases of pure tobacco

amblyopia without alcoholism are observed. In this country, however, he felt quite sure that few cases are seen in which there is not a history of alcoholism associated with the excessive use of tobacco, and now Dr. deSchweinitz has added his very interesting observation of the effects of diabetes when associated with the excessive use of tobacco in bringing about the same form of scotoma rather than a simple pericentral one.

Prolonged Miosis for the Control of Increased Intraocular Tension with Remarks on the Preparation of Solutions of the Miotics.

Dr. G. E. deSchweinitz and Dr. B. F. Baer, while expressing the conviction that an operation destined to produce a fistulous (filtering) area offered the best treatment for chronic glaucoma, and should, in suitable instances, be performed as early as possible, nevertheless recognized that for various reasons operation could not invariably be performed, and that miotics must always maintain an important place in the therapeutics of glaucoma, both with and without the assistance of operative interference.

They quoted the case histories of patients with chronic glaucoma, whose eyes had maintained normal tension, vision and field of vision, solely under the influence of miotics, in one instance for over twenty years. Also case histories indicating that one eye had remained in satisfactory condition, but the other eye had steadily lost ground, and other histories which showed that altho miotics had availed for years, a period had arrived when they failed in this respect, and additional ones in which after a longer period of satisfactory tension and vision sudden attacks of acute glaucoma had supervened, in one instance terminating in one eye in malignant glaucoma. All these facts showed plainly, they said, that it was not safe to trust to miotics alone, unless assured that the patients would remain under frequent expert observation—an assurance which only too often could not be secured. Hence, their conviction that a suitable operation, in proper circumstances, was the best procedure.

One untoward action of the long-continued use of miotics consisted in the development of the well known toxic conjunctivitis, altho in some instances (cases here quoted) the drug had produced no deleterious conjunctival influence, even when used for years—in three cases for 12, 14 and 18 years respectively.

They next described, by permission, the method of preparing miotic solutions (which would apply equally well to mydriatic solutions) devised by the well known pharmaceutical chemist, Mr. J. W. England, who wrote as follows: "I have been making solutions of pilocarpin hydrochlorid and physostigmine sulphate with a special rose water, filtering thru paper. The formula for the 'Special rose water (No. 1)' is: Boric acid, 18 grains, and stronger rose water, 4 fluidounces. Dissolve the boric acid in the stronger rose water and filter into a sertile bottle. If the rose water is cloudy from supersaturation of volatile oil, mix with purified talc before filtration. To filter, use a glass funnel, with a flattened plug of absorbent cotton in the neck and upon this rest the folded filter paper. Return the first portions of the filtrate if not absolutely clear.

There is something more in rose water than the odor. It seems to be slightly anesthetic, however small the amount of oil in the rose water may be. The chief constituents of oil of rose are the alcohols geraniol and citronellol, the two together being present to the extent of 70 to 75 per cent, while the citronellol constitutes about one-fourth of the liquid portion of the oil. Traces of esters of these alcohols are also present. (B. P. C. 1923, 765).

I believe that this "Special Rose Water" can be still further improved by adding 0.85 percent of sodium chlorid—making it a physiologic salt solution in rose water. The formula would be:

Boric acid, 18 grains.
Sodium Chlorid, 18 grains.
Stronger rose water 4 fluidounces.
Prepare as for "Special Rose Water No. 1."

This solution had been used by the author with perfect success, but only once, in a patient with chronic glau-

coma, whose conjunctiva quickly became inflamed, when the salts of pilocarpin or physostigmin were employed, in watery solution. They published, with his consent, Mr. England's formula, in order that others might try it in suitable cases, and thus sufficient information be gathered to establish, or not, its value as a substitute for the ordinary liquid solutions of miotics.

Some Interesting Changes in the Vessels of the Fundus.

Dr. L. Waller Deichler and Dr. A. Barlow presented three cases of changes in the vessels of the fundus. The first, Mrs. M. W. B., aged 48 years, was seen on Dec. 12, 1917. The past history was negative. Ocular trouble began in August, 1911, when, within a period of a few hours, her vision was reduced to light perception. Slow improvement occurred and in March, 1912, she had recovered two-thirds normal vision. In August, 1917, she was told that her vision was normal in that eye with correction. Shortly thereafter vision was again suddenly lost, accompanied by neuralgic pain. Injections of colloidal iodin were given over a period of two months. Vision, 15/200 in the right eye without glass; 15/100 with glass. In left eye 15/20 without, and 15/12 with glass.

Examination of the right eye ground, under mydriasis, showed vitreous opacities, large chorioretinal disturbances from the disc over the entire macular region and well into the periphery, with atrophy and pigment heaping. The choroidal circulation was plainly visible thruout this area. No hemorrhages were present. Large relative and absolute scotomas were present.

The left eyeground showed retinal disturbances and two small glistening spots in the choroid up and in from the disc. A relative scotoma was present. When seen in October, 1925, the condition was much the same, except for some pronounced perivasculitis of the choroidal vessels, which condition led to the present presentation and study.

The second case, seen and studied with Dr. Barlow, Mrs. E. S., aged 54 years, was first seen on Nov. 13, 1925. She had lost the sight of the left eye four years previously thru retinal hemorrhage, the result of high blood pressure. Vision: Right, 20/30; Left, fingers at 9 inches. Examination of right eye showed changes of arteriosclerosis of the retinal vessels. Vitreous clear. A few small, linear hemorrhages are present on the temporal side of the disc. The left eye shows cloudiness of the retina and disc, hemorrhages and atrophic areas are present. The arteries show sclerosis and tortuosity with perivasculitis and irregularity. The veins are unusually looped and tortuous. The ocular picture is the result of general arterio-capillary fibrosis with cardiac hypertrophy. Arterial tension varies from 218/120 to 248/138. Renal involvement is also manifest.

The third case, H. J., aged 48, a wood-worker, was first seen on Jan. 20, 1926. Vision: O. D. 20/70 without correction; 20/40 with correction. O. S. 20/50 without correction; not improved with glass. The ophthalmoscope shows no lesion in the right eye. In the left is a fluid detachment of the retina above. A dense band of vitreous exudate extends transversely thru the vitreous, upon the surface of which are several fine blood vessels which, towards the extremity of the exudate, ends in numerous fine and anastomosing loops, transforming the mass into a connective tissue structure. The disc edges are blurred and many small hemorrhages are scattered over the retina.

When seen again on Feb. 18, 1926, the condition of the left eye had decidedly changed. Many large and small floating vitreous opacities were present, and the detachment had disappeared. A dense, pure, white, glistening, irregular sphere occupied the center of the vitreous about one disc diameter above the disc, from the margins of which an irregular fern like growth with many fine anastomosing blood vessels extended outward. On a second projection to the nasal side above and to the temporal side this same fern like formation is shown with a dense, white streak running well out to the periphery, with a distinct blood vessel following the streak and at its

temporal end curving downward and backward to become continuous with the superior temporal artery.

An Intraocular Tumor of Unknown Pathology.

Dr. Aaron Barlow's patient, Mrs. B. G., aged 50 years, came under observation at the Mt. Sinai Hospital on Jan. 30, 1926, with a history of having fallen and struck the left eye three years previously. The consequent swelling disappeared after the use of hot compresses, in about two weeks. Medical aid was not sought at that time. Later, however, she discovered that she could not see with this eye, and presented herself for examination on Dec. 2, 1922, at which time vision in O. D. was 20/30; O. S. fingers at 6 inches. External examination was negative. Ophthalmoscopic examination of O. D. was negative; O. S. showed edema of the temporal portion of the retina above and extending downward to the macular region. Urinalysis was negative. She did not return for treatment but went elsewhere and had glasses prescribed.

Examination on Jan. 30, 1926, showed vision O. D. 20/20; O. S. fingers at 8 feet, eccentric. Inspection externally, negative. Ophthalmoscopically, O. D. negative. O. S. showed a linear opacity in the lens cortex at 7 o'clock. Thru the upper part of the well dilated pupil was seen an opaque, grayish body extending upward and outward and well forward into the vitreous. This is nearly spherical, sharply circumscribed, about the size of a large myopic disc. Its margins are everywhere free so that the whole mass appears to be suspended in the center of the vitreous midway between the lens and the disc, without any visible attachments. Above and to the temporal side about 1/3 of the disc is obscured by the mass. The remainder of the disc is plainly visible, with fairly well defined margins and normal blood vessels. The anterior surface of the mass presents an abundant supply of fine blood vessels which are lost at the margins. The fundus, excepting the part hidden from view, presents no abnormalities.

There are numerous fine floating vitreous opacities. To the inner side of the mass there is a small cone-shaped, fixed vitreous opacity with a fine, short, undulating filament attached to its base. Transillumination reveals a translucent mass with thickened capsule.

Slit lamp study shows the capsule with brilliant white criss-cross network of fibrous tissue. The Wassermann is negative.

Discussion. Dr. H. O. Sloane stated that thru the courtesy of Dr. Barlow, he had the opportunity of studying this case at the Mt. Sinai Hospital. This patient had a body somewhat larger than the disc, whitish in color, with its surface covered with fine vessels (apparently arteries) which seemed to lie in front of the retina and apparently quite free in the vitreous. Its margins were completely rounded and in getting the patient to move her eye in all directions all the edges could be distinctly seen. Dr. Barlow stated that there was an attachment to the retina below and to the nasal side, but, at the time of Dr. Sloane's examination, he did not see it. It was his opinion that the new growth was probably cystic in nature. The external appearance of the eye was normal and the tension taken by the finger was normal.

Leighton F. Appleman,
Clerk.

ST. LOUIS OPHTHALMIC SOCIETY.

February 26, 1926.

Dr. W. E. Shahan, Presiding.

Mechanism of Accommodation.

Dr. Wm. H. Luedde read a paper on this subject which will be published in full. The general unquestioning acceptance of the theory of Helmholtz in regard to the mechanism of accommodation should constitute a challenge to those who would know the actual facts. Popular endorsement of a favorite hypothesis does not make it a truth. Study of the mechanism of accommodation in other orders of vertebrates — fishes, reptiles, amphibians, birds, and mammals—offers no

proof for the Helmholtz theory and much that directly contradicts it. Helmholtz' own original statement was the well guarded expression of a mere assumption. Important points in Helmholtz' presentation were discarded by Hess, one of his most conspicuous supporters. Experiments of Hensen and Voelckers, accepted as the earliest and best support for the Helmholtz theory, are also fully in accord with Tscherning's interpretation. Schoen's and Gifford's objection to the unnatural idea of constantly sustained tension when the eye is at rest; reference to mathematical calculations of lenticular surfaces; review of histologic research; report of certain clinical observations of the effect of miotics on the position of dislocated lenses which defy explanation according to Helmholtz' hypothesis but indicate that the vitreous humor is pushed against the lens during active miosis; all tend to support Tscherning's hypothesis.

Discussion. Dr. J. H. Gross asked Dr. Luedde whether he considers it advisable to use miotics in cases in which the lens is or has been dislocated backwards.

Dr. W. H. Luedde in closing the discussion said that of course it was conceded by both Tscherning and Helmholtz that there is a movement forward of the anterior lens capsule during accommodation; that is, the lens bulges on the anterior surface. The exact form of that bulge is what they differed about. Helmholtz thought it spherical, and Tscherning claims he has shown by flattening at the border of the lens it is conical. As to the amount of movement of the equator forward, Dr. Luedde had stressed that point in Voelckers' paper because Helmholtz had said that if the vitreous moves forward the lens must move forward; and Voelckers shows that the lens does move forward. Tscherning says that he doesn't want to express himself on that point. He says that the observations on the movement of the lens are subject to such error that he is not certain. According to the Helmholtz hypothesis there is a lessening in the diameter of the lens during accommodation. References are found in the literature to actual lessening of the lens in coloboma where iridectomy has been done. Voelckers says very frankly that his observations are so fraught with error on the lessening of the lens that he prefers not to make any statement. Tscherning takes the same view and adds that the change is so slight that it does not correspond to the diminution of the diameter required by the Helmholtz theory. The posterior surface of the lens remains where it is or may go slightly backward. Voelckers found this by putting needles thru the sclera posterior to the lens. Tscherning made measurements by implanting slightly flattened needles and finding that they turned a little bit. It is easy to understand why it might do that. If the peripheral portion of the lens is pushed forward by the vitreous it is quite possible the central vitreous might retract a little bit. The attachment between the posterior capsule and vitreous centrally is very intimate. That is the place where the attachment must be broken during the capsule operation. The place where there is traction forward on the vitreous is at the periphery. As to Dr. Green's statement about the danger of trusting to miotics habitually; Dr. Luedde does not intend to do so. He did not operate on this boy when the lens was in the anterior chamber because it seemed utterly hopeless in the mental condition he was in and also because of the mother's stern objection that she would not permit the operation. After he had once replaced the lens and the boy was comfortable he could not get these people to consent to operation. So far it has not been forced on him. The vitreous is clear; the vision is perfect; 20/20 in one eye and 20/30 in the other. He thinks the reason it has remained clear is that miotics have kept the lens from bobbing around and causing damage by collisions with the essential structure of the vitreous. In the last chart he had shown there was cataract and iridodonesis. The old fellow did not want any operation done. He merely tried miotics to see if there was any response. He felt it was a fair experiment as long as the eye showed no irritation. In regard to Dr. Gross'

question he did not see how he could recommend this method, but felt more inclined to try it if such a case came along again. He was not advocating it from the therapeutic standpoint. It was this interesting sidelight on the mechanism of accommodation that induced him to present these considerations at length.

Cataract Operation in a Case of Glaucoma with Iridodonesis.

Dr. J. H. Gross read the following case history: W. F., aged 72, general health good. At the age of 55 he had developed bilateral cataract. The cataract in the left eye was more advanced and was removed by a modified linear extraction with iridectomy some years ago with a visual result of 18/30. His right eye did not give him any trouble until four weeks ago when it became painful. The tension was somewhat high, and the corneal epithelium was slightly roughened. Miotics were tried and gave some relief, but the condition of the cornea did not improve. The intraocular tension remained up and the nasal field was somewhat diminished. When lying on his back, iridodonesis in the glaucomatous right eye was noted. It was Dr. Gross' opinion that the cataractous lens had become loose, and probably caused the increased tension and that an operation should be done. An iridectomy might reduce the tension, but would leave the loose lens as a source of continued trouble. A modified linear extraction (opening the lens capsule, and iridectomy) would probably leave lens remnants, or parts of the capsule in the eye; which, of course, would be very objectionable in a glaucomatous eye. A Graefe knife was passed into the anterior chamber well back of the limbus and a little of the aqueous allowed to escape; the point was then pushed across the anterior chamber, the counter puncture made, and the incision made upward, as close to the corneoscleral margin as possible. An iridectomy was then made and the lens delivered in its capsule. The capsule was not ruptured by his instrument after the iridectomy had been made and he had pressed on the eye and the lens had come out followed by a small quantity of fluid vitreous. The only hemorrhage apparent was from the conjunctiva and the patient had very little pain after the operation. The eye was inspected on the fifth day; the anterior chamber had reformed; there was a small quantity of blood in the anterior chamber and the cornea was clear. After several days the blood in the anterior chamber had disappeared and the patient counted fingers, without correction, at three feet.

Evulsion of the Optic Nerve.

Dr. J. M. Keller reported a case of this kind.

Discussion. Dr. E. H. Higbee said he had examined a patient who had shot himself thru the temple. The shot entering the right side had passed so far forward that it entered the right orbit, completely severed the nerve, then passed thru into the left orbit, and severed the left optic nerve. The appearance of the nervehead areas was that of an atrophy except that they had a greyish color. The surprising appearance to Dr. Higbee was that the blood vessels looked almost normal, extending from the periphery of the nervehead excavation out to the periphery of the fundi. This appearance is explained by Parsons who states that the vessels refill thru direct and indirect cilioretinal anastomosis.

Dr. W. H. Luedde said that he would like to ask Dr. Keller how he accounts for the fact that the retinal vessels were so well filled. Is it possible they were outside of the torn sheath of the optic nerve?

Dr. J. H. Gross said that he admired the pictures of the fundus which Dr. Keller had made and as they seemed to have just about the correct color he would like to know what percentage of mercurochrome had been used.

Dr. J. M. Keller in closing said that in answer to Dr. Luedde's question, the refilling of the retinal vessels has been explained by a fresh anastomosis formed between the retinal vessels and the choroidal vessels at the point of rupture. In answer to Dr. Green that forceps deliveries have caused evulsion of the optic nerve, he believes that in those cases there is a compression of the bones of the orbit and an incom-

plete luxation and evulsion of the eyeball, so that the nervehead is torn out by the eyeball being pushed forward. He used 1% mercurochrome in drawing the picture. There was no vision. Why that little island corresponding to the location of the macular region should remain in the center of the choroidal rupture and have the same color as that of the remaining fundus he could not explain.

CHARLES W. TOOKER, Editor.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

February 15, 1926.

EDWIN J. GARDINER, M.D., President.

Pigmentary Degeneration of the Retina.

DR. MICHAEL GOLDENBURG reported the case of W. M., male, aged 39. Vision has not been very good for the past twenty-seven years. During the last five years there appeared a scum like process over both eyes so that he could not see; vision could not be improved with glasses. His general health has been poor for many years.

Examination disclosed an emaciated man, much older than his years; mentally, distinctly subnormal, speech slow and hesitant, as if it were difficult for him to grasp what was said and required concentrated effort to answer. He was able to walk with the aid of two heavy canes.

There was marked absence of orbital fat, so that the eyes were set deep in both orbits. Conjunctiva was a chalky white. Cornea was negative. Anterior chamber was negative as to depth and transparency. Tension to palpation was slightly minus by Schiötz—8½ in each eye. Pupils were equal, round and dilated to about 4 mm., but did not respond to light or accommodation. Attemps to dilate with mydriatics (atropin sulphate crystals) failed of response. Iris from an anatomic standpoint was negative. There was no evidence of any previous inflammation or degeneration. No pigment disturbance could be noted. Both lenses were a deep gray, opaque and lusterless. A ring of denser opacity with chalk like deposits was seen in the region of the pupillary border. Under good illumination and magnification, this ring appeared slightly elevated, but was subcapsular. There was no evidence of any exudate on the anterior surface of the capsule.

Vision—O. D. perception of a bright light only. Projection poor especially on temporal side. O. S. Hand movement. Fair perception, poor projection.

Spinal fluid—Wassermann plus 2. Cell count 56, Globulin plus. Urine—negative. Eye culture—negative.

On June 16, 1925, the left eye was prepared for a lens extraction. The usual corneal section was made. Fearing that adhesions existed between the iris and lens capsule, a spatula was passed between these two structures, but no synechia were encountered.

A small iridectomy was performed, followed by the usual capsulotomy. Then an attempt to deliver the lens, with considerable pressure, failed to move it. A more extensive capsulotomy was restorted to, but still the lens could not be delivered.

A capsule forceps was now used and a large bite removed, after which the lens was delivered very easily. This was followed by irrigation of the anterior chamber.

The lens capsule remaining appeared very dense, and the chalky gray ring, seen previous to the operation, was still attached to the capsule. With a thin iris forceps the entire capsule was removed. The pupil appeared clear and black. The usual toilet was attended to and both eyes bandaged.

The capsule was now examined under good illumination and magnification. There was no evidence of any previous inflammation or resultant synechia.

The grayish ring previously noted consisted of a distinct elevation, which was firm, with the consistence of cartilage. The lens was of the usual size, fairly opaque in the anterior layers, but quite clear in the posterior layers.

Recovery was uneventful.

On June 23, one week later, the other eye was operated upon. The difficulties encountered in the first operation were again evident in this eye.

From a surgical standpoint the case made an uneventful recovery. The patient was placed on an energetic antiluetic regime with marked benefit.

As nothing very unusual had been anticipated, no attempt had been made to examine either fundi, until July 25th, when the patient requested glasses. The house surgeon was instructed accordingly, and reported no improvement with glasses in the right eye; in the left, with a +4.00 sphere, the patient could read 20/65.

Examination of the fundus disclosed an unusual picture, present in both eyes. The right fundus showed the greater destruction.

The first impression one received on using the ophthalmoscope was that of marked blood staining such as we find on the cornea. The arteriosclerosis of the vessels, especially of the choroid, was marked. With such destruction, one wonders how the patient was able to see at all. The atrophy was found to be more marked in the immediate vicinity of the disc, and became less so toward the periphery. The coloring of the disc was likewise somewhat unusual, and can probably be placed in that classification sometimes referred to as a retinitic atrophy, not wholly unlike the type seen in retinitis pigmentosa. Large coffee ground patches seen thruout the fundus were distinctly unusual and interesting.

One must conclude that this unusual coloring is anterior to the choroid and posterior to the anterior layers of the retina. It would seem logical to locate these changes in the pigment epithelial layer, inasmuch as the coloring is foreign to the middle or anterior layers of the retina. Whether the pigment changes are due to an inflammation or a degenerative process is probably open to question. However, those who have seen the case are inclined to the belief that we have here a pigmentary degeneration of the pigment epithelial layer of the retina.

This may be explained on the basis of the marked arteriosclerosis of the choroidal vessels, which is probably secondary to the luetic infection. The coloring and distribution of the pigment is unique and rather difficult to classify.

Epithelioma of the Orbit.

Dr. Michael Goldenburg presented the case of a white woman, married, aged 30, who was admitted to the Illinois Eye and Ear Infirmary March, 1919. She gave a history of drooping of the right upper lid for the past four years. She was the mother of a family who were all well. Examination showed a well nourished woman, with some ptosis of the right upper lid; eyeball displaced downward; movement of eyeball unimpaired. Digital palpation revealed a movable tumor ½x½ inch in size, below the roof of the orbit and apparently attached to the orbit. Laboratory findings were negative, and blood count normal.

An incision was made along the line of the eyebrow, extending into the orbit, revealing the tumor mass lying beneath the incision. The mass was encapsulated, and during operation the capsule was ruptured and a white cheesy mass expelled. The tendon of the palpebral muscle having been cut, it was sutured to the orbital ridge.

Laboratory Report (synopsis). In the specimen removed at first operation, reported by Dr. Lane, the blood vessels were surrounded by endothelial cells, two or three layers deep. (Diagnosis—endothelioma.) On the last specimen, the report by Dr. Richard Gamble gives a diagnosis of endothelioma, closely resembling scirrhous carcinoma, from the region of the lacrimal gland.

In November, 1923, the patient again entered the hospital, giving a history similar to that previously recorded; in addition there was some pain in and around the orbit, and inability to elevate the upper lid. There was marked ptosis of the right upper lid. The eyeball was displaced downward and outward; no impairment in motion. Vision at this time was R. 20/50; L. 20/20. On digital palpation a slightly movable mass, apparently adherent to the roof of the orbit, was found.

On Dec. 15, 1923, the orbit was again entered thru the scar of the previous incision. Five or six small bluish gray nodules of various size were removed. The incision was enlarged and the eyeball well retracted, so that the cavity could be thoroly inspected and ex-

plored, which was done without difficulty. The site of origin of the masses could not be definitely located. The skin was sutured and the stitches removed within a few days. The specimens sent to the laboratory and the report thereon concurred in the pathologic findings previously recorded.

Two weeks later a mass could again be outlined in the region occupied by the removed tumors. Radium-roentgen ray treatment was suggested. After several treatments it seemed there was some effect in controlling the symptoms of pain and the size of the mass.

On Jan. 4, 1926, the patient returned a third time with the same condition present. The tumor mass seemed more dense and could not be outlined; vision in the right eye had decreased to 20/65. All other eye findings were negative. There was considerable pain. Operation was again advised, and on January 5, 1926, incision was made thru the old scar. No definitely outlined tumors could be found; the palpable mass consisted of a large amount of dense connective tissue, with here and there small bluish gray projections of material resembling the tumors previously removed. This mass was removed with great difficulty, presumably due to tissue changes resulting from the radium and x-ray treatment.

The patient made an uneventful surgical recovery; a mass still seems to be present, however, and the eye remains depressed downward and slightly outward.

Surgical Treatment of Posterior Synechia.

Dr. Michael Goldenburg presented a young colored man, aged 26, who was admitted to the hospital on Jan. 14, 1926. He complained of vision failing for the past seven years; had had repeated attacks of inflammation in both eyes; had been given some antiluetic treatment, but reacted very badly.

Examination disclosed follicular like elevations on the conjunctiva of both lids; pupils were small and irregular, and iris completely bound down by posterior synechiae; the peripheral half of each iris was pushed forward against the posterior surface of the cornea; pupils were covered with exudate. Tension: R. 6, L. 8¼. Blood Wassermann negative.

On Jan. 19, 1926, a small keratome incision was made thru the limbus at 12 o'clock. With a thin spatula the iris adhesions were separated, a very small blunt hook being used in the upper circumference of the iris. Upon examination two days later, the pupils did not react to atropin, but the pupil was round, about 4 mm. in size, and fairly black.

Osteoma of the Orbit.

Dr. C. W. Rainey presented for Dr. George F. Suker, a case which had entered the County Hospital on the 17th of January, 1926, with complaint of protrusion of the right eye, pain in the eye, and feverish spells. The eye condition was first noticed six years ago, and had slowly but progressively become worse. At times there was a sensation of fever, relieved by cold applications. Routine questioning of the patient revealed nothing in the family or personal history which would have any bearing on the condition. Routine physical examination was negative except that when she first entered the hospital it was thought there was a large mass in the right kidney region. A cystoscopy was done, and a report made of a small tumor in the bladder at the right ureteral orifice. Subsequent examinations, however, failed to show a tumor in the kidney region. The bladder mass receded in size.

Examination of the eyes showed vision to be 20/15, both eyes. The proptosis was noted. There was no limitation of movement of either eye, in any cardinal direction except upward and inward in the right eye, and convergence in the right eye was limited. The fundus was negative. Roentgen ray report showed a dense bony tumor in the region of the right orbit.

The patient was operated on the first of February, 1926, in an attempt to remove this tumor. A small L-shaped incision was made which exposed the tumor directly under the scalp. It was the size of a small orange, well marked off from the adjacent portion of the

skull, and was dark in color. When the chisel was used a great deal of hemorrhage was encountered. In view of the fact that the tumor was so extensive, and because of the hemorrhage, it was thought wise to stop the operation. The wound was closed and healed by first intention. Sections microscopically showed cancerous bone without many changes suggestive of malignancy. There were several round cells to be seen.

Discussion. Dr. George F. Suker, in commenting on Dr. Rainey's case, said that the interesting feature was that the tumor was excessively vascular, and in a rather unusual location for that type of growth. Such tumors were not uncommonly found in long bones or large flat bones, but seldom in this location. The vascularity was so excessive that it was necessary to stop operating and close the wound. Fortunately, it was a locally malignant tumor. It was possible to feel the extent of the tumor mass in the orbit, but on account of the excessive hemorrhage it was thought best not to attempt its removal. The peculiarity of the proptosis was very marked, and when the eye was closed the entire eyeball rolled up and outward under the upper lid, and it was possible to feel the insertion of the optic nerve by careful probing. The fact that the patient still had 20/15 vision in that eye was noteworthy, as with the amount of stretching present, this seemed hardly possible. There was no intraocular neuritis, nor choked disc on account of pressure. The amount of pain was negligible. Roentgen ray therapy had been suggested with the hope that it might close the sinuses, which would facilitate the removal of the bony tumor. If it were an ivory tumor it could be chiselled out, as ivory was not vascular.

Surgical Treatment of Squint.

Dr. Jay Webb Lowell read a paper on this subject. See p. 600.

Discussion. Dr. Merlin Z. Albro had heard Dr. Lowell's paper with much interest, and congratulated him on his success in adding to the accuracy of squint operations. In most cases these operations were for the cosmetic effect, but there were a number of cases in which binocular vision could be and was established, and careful observation of such cases would lead to many more satisfactory results. In a case of Dr. Woodruff's which he had observed some years ago, it seemed the suppression of binocular vision was beyond recall. The case was operated on by tucking and tenotomy, and a few days later, upon examination, he noted that fusion, sufficient to last the rest of the man's life, had been obtained.

He mentioned two cases of his own —a boy of 11 years of age and a girl of 6—both squinters. The girl was treated by refraction and fusion training; the boy had a vertical squint of very high degree, but after considerable attempt at fusion training a little was found. The superior rectus was tenotomized and the eye came into very good position. After about three months, test showed only one-half prism diopter of hyperphoria, and therefore binocular vision and fusion.

In each individual there existed a period of binocular vision. This began about the sixth month after birth, and continued until the squint appeared, perhaps at the ninth month, or as late as the fifth or sixth year. During this period development of the macula and of central vision continued. Central vision was a thing to be learned, like piano playing, walking, or talking, and by continued practice and repetition of the same act, automatism became established.

Whatever development of the macula took place meant in reality that certain nervous elements in the retina had begun to function, had acquired functional ability; that corresponding nerve fibers had become permeable and capable of being traversed by stimuli on their way to the brain; that corresponding cells and groups of cells in the receiving portion of the brain had begun to function and had developed functional ability. The more these end organs and their lines of communication and their receiving stations were used, and the longer they remained in use, the higher would be the degree of development to which they would obtain. When squint arose, suppression

of central vision in the squinting eye followed. While suppression of vision was not clearly a conscious act, it was nevertheless a voluntary act,—an act performed to avoid diplopia, to avoid the confusion due to the reception of mixed images. It was a protective act, intended to relieve the association tracts in the brain from the distress of mixed true and false messages arriving at the eye receiving station in the brain. In walking, if a child was to be guided by its eyes, they must furnish single and true reports thru association pathways to the complicated apparatus which directed and controlled walking.

Suppression of vision, then, was a brain affair. Messages received from one eye was disregarded until a habit became established which in most cases later became a fixture. Therefore, we had a mechanism more or less developed according to the length of time it was used before suppression, and more or less developed according to the intensity of effort expended upon it during its period of functional activity; in other words, a mechanism possessing a potential, which under certain conditions could be reawakened and its potential developed into actual working power.

After operation the squinting eye tended to be drawn out of position by two elements—contraction of the scar, and the fact that images fell in the area of peripheral vision. Therefore, practically all operated cases showed a slight deviation, which might or might not disappear in later years. If the brain could be induced to use the macula and so fix the position of the eye, deviation could not occur and the operated case would be 100 percent perfect. This could be done in the majority of cases up to eleven years of age; in many cases of divergent squint; in a certain number of cases of alternating squint; and if before and again after operation serious and sustained efforts were made, many more cases amenable to macular training would be found.

Dr. Will Walter was much interested in Dr. Lowell's paper because of the fact that he used the tropometer, which he himself had used since Stevens brought it out over twenty-five years ago, and had employed in practically every case of suspected muscular imbalance during that time. He hoped to tabulate the results of his findings at some future date. He had not found this very definite total of 100° of excursion laterally—Stevens, he thought, mentioned 45° to 50° out and 50° to 55° in, as normal. Of course, all such measurements were only approximate, but he would say that in the small eye a lower rotation and in the larger eye a higher rotation, even up to 55° out to 65° in, had been found. In a surprising number of cases, changes from the normal of supraversions as well as adversions and abversions, had been found; many of these eyes showed hypertropia. The tropometer was also a very quick method of disclosing a paretic or a paralytic condition. It was a good method of differentiation in the neurotic type of imbalance wherein there was no peripheral abnormality, but a central neurosis—incoordination. The use of the tropometer and the method described were based upon that very fundamental idea which should apply to all medical work, viz., to try to find what the normal should be and then endeavor to approximate it as well as was possible. Where there was any possibility of developing binocular vision, the tropometer method offered, in his opinion, the best chance, since the eyes were put in anatomic balance to begin with.

Dr. Harry Woodruff noted that Dr. Lowell had used the terms "macular" and "accommodation." To one who had studied strabismus, with particular reference to Dr. Howe's work on muscles of the eye, it was surprising to note the result of his investigation showing that the muscles varied so greatly in their insertions. Probably slight variation in the curve of the insertion of the muscles into the sclera was the rule. This, of course, was difficult to determine. There were also supernumerary muscles and bifurcated muscles. The majority of cases of strabismus operated upon came under the classification of accommodative

which had gone beyond the time when glasses or fusion training were of any use, or had not fallen into the hands of Dr. Albro, who would give them the time and attention and patience required. Therefore, in the majority of cases the result to be obtained was cosmetic. His rule was in convergent strabismus where the stronger muscle was tenotomized and the outer muscle tucked, not to overcorrect, always to be certain there was a slight undercorrection. This he believed a wise precaution. The converse held true if there was a divergent strabismus—there an overcorrection was permissible—leaving the eye very slightly convergent. The method of recession was the same as tonotomy, except that the retraction of the muscle was limited. It prevented the disastrous effects that might follow a too free tenotomy.

Dr. O. B. Nugent asked if, following the operation, there was any tendency to over- or undercorrection where the eyes had been pretty well fixed at the time of operation; if so, to which side, and was it uniform in following the operations Dr. Lowell had performed.

Dr. Lowell (closing) said that he misquoted in saying that he had had no trouble with diplopia. There had been no trouble which he was unable to correct by fusion training or by the use of prisms. In practically all cases where 100 per cent results, that is, binocular vision, had been obtained, there had been at least temporary trouble with diplopia. It was quite true that not all patients rotated the eye inward 50° and outward 50°. This could be noted in twenty consecutive cases shown. The attempt was to get the extremes of rotation outward and inward. Dr. Woodruff had mentioned Dr. Howe's very interesting sketch showing variation of insertion of a large number of muscles where one was superimposed on the other. If it were not for the physiologic variation in individuals, it would be possible to state a definite amount of muscle shortening required to rotate the eye a definite number of degrees. A point of rotation had been demonstrated in his researches which was eccentrically placed and very constant in a large number of cases. This center of motion was not in the center of the scleral curve. As the eye rotated there was a combined motion outward.

Luminal Poisoning with Conjunctival Residue.

Dr. Jesse H. Roth read a paper on this subject. See p. 533.

Technic of Total Ectropion Operation.

Dr. Earl L. Vernon read a paper on this subject. See p. 598.

Clarence Loeb, Secretary.

MINNESOTA ACADEMY OF OPHTHALMOLOGY.

February 19, 1926.

Dr. E. R. Bray, Presiding.

Bilateral, Congenital Colobomata of Irides.

Dr. W. W. Lewis reported the case of a man aged 52, whose right pupil was at the limbus at 11 o'clock and the left about 1 o'clock. The right eye apparently had had considerable vision. The patient had gone thru grade school without trouble. He had been a farmer for several years and for the last 8 or 10 years had driven a truck. Dr. Lewis had attempted to measure the refraction of the right eye but no lens improved the vision. In the left eye there was a tremulous iris. Apparently the left eye had been used relatively little. It seemed almost inconceivable that he could have completed school with such poor vision. He lived in a small town where he had no trouble in getting around. The vision in the one good eye had been diminishing lately, probably due to oncoming sclerosis of the lens. Dr. Lewis stated that the making of a pupil in either eye was to be considered.

Discussion. Dr. Schwartz asked how Dr. Lewis would explain the case on developmental grounds.

Dr. Lewis stated that colobomata of the iris in most cases are downward and stop at the iris, and in other cases the coloboma extends even farther and includes a part of the ciliary body and even the choroid. He said he had

never seen this particular condition upward and outward as in this patient. He was not able to say whether this coloboma extended into the ciliary body, but in all probability it did in the left eye. He said he did not know how to explain it from an embryologic standpoint. It was a congenital anomaly for which there was no particular scheme in embryology.

DR. SCHWARTZ stated that this case was very interesting to him particularly as 5 or 6 months ago he showed several cases of congenital anomalies and one of them had ectopic pupils and coloboma of the iris, choroid and optic nerve. These were both downward. The question was how we might explain a coloboma upward.

DR. JOHN BROWN said he thought that was explained by Dr. Wagner who said that later developments in embryology show that the fissure develops in the optic cup, but from the margins of the optic cup unequal growth leads to the development of practically four lobes or segments of growth which by continuity become the margin or region of the limbus. Dr. Brown believed that Dr. Wagner thought it was due to that fact that one might get a difference in relations at the limbus where the colobomata are found.

DR. SCHWARTZ said that might be true but this hypothesis had not yet found its way into the standard textbooks.

DR. MORTON said that such a clinical picture as this might attest to the presence of a number of clefts or indentures along the cup margin, a condition undoubtedly present on occasion. He could see why, embryologically, even assuming the usual condition of but one cleft, the position of this might vary, and thus this developmental displacement would perforce result.

DR. SCHWARTZ said it very frequently happened that the cleft, instead of forming on the under side of the optic vesicle, was considerably to one side. That would account for a coloboma, say 45 to 90 degrees off the vertical axis, but that it should swing around to the upper pole seemed remarkable. Nevertheless, Dr. Schwartz said it seemed that one of two conditions must obtain here, either the cleft in the optic vesicle must have formed on the dorsal side from the very beginning, or the optic stalk must have undergone a torsion thru 180 degrees, so that the most distal portion of the optic vesicle was situated superiorly instead of inferiorly. Of the two possibilities, the second was by far more likely.

Circumcorneal Nevus.

DR. LEWIS said this was one of the most interesting cases he had ever seen. Most of the men said they supposed it was a scleritis, but it was not. There was an area of 5 or 6 mm. surrounding the cornea showing a bluish hue of the sclera. The man had a circumcorneal nevus in the eye. Up to three weeks ago he never had any trouble. Three weeks ago the patient developed an iridocylitis in this eye, and Dr. Lewis stated that since the development of the inflammatory condition the diagnosis had been really difficult without the knowledge of the preexisting nevus. The vision had been normal; the eye has never been irritable, and never inflamed prior to this acute iritis.

Dr. Lewis stated that this was a corneal nevus (congenital, of course) with a superimposed iridocyclitis.

Cicatricial Ectropion.

DR. M. W. WHEELER presented the case of a man who was burned Oct. 3, 1925, with gasoline. He had a cicatricial ectropion of the left lid on account of which he was unable to close the eye. This resulted in a keratitis. Dr. Wheeler had attempted to improve the lid by loosening the cicatricial tissues and inserting a skin graft from the arm. For cosmetic reasons, a dense band of scar tissue extending from the middle of the lid down across the angle of the eye and attached to the skin of the nose of the right eye was dissected out.

Herman Ludwig Ferdinand von Helmholtz.

DR. JOHN F. FULTON read a paper on this subject.

W. E. CAMP, M.D.
Recorder.

American Journal of Ophthalmology

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SYMPATHETIC OPHTHALMIA.

This has been recognized only within the last century. Altho glaucoma still presents many unsolved problems, it was known to the Greeks, who gave it that name. Cataract operations have been done for thousands of years. But sympathetic ophthalmia was first considered as a clinical entity in the third edition of Mackenzie's text book in 1840. Its essential character and complete definition, are still unsettled. More general and exact agreement is needed, as to what should be classed under this head, what name best describes it, what are the characteristic lesions and symptoms, what are the essential factors of its pathogenesis? On the answers to these questions, still to be obtained, must depend the most effective prophylaxis and treatment.

Mackenzie, who previously had simply stated that: "We sometimes meet with severe sympathetic inflammation in the eye which has not received the injury;" later (4th edition) reported six cases of sympathetic ophthalmitis with perfectly characteristic histories of marked, chronic, relapsing uveitis. But the earlier literature and many subsequent papers relating to it show much confusion of this clinical form of disease with bilateral uveitis and other bilateral ocular diseases, of different origin and character; as well as with nervous manifestations, without organic lesion of the sympathizing eye. Under the name sympathetic ophthalmia are reported a large number of anomalous cases that might better be excluded, when we attempt a study of this condition.

A very important step toward defining the disease was made when Donders reported his case of "sympathetic irritation" of the eye. The patient had suffered injury to the R. eye; and, following this, the L. eye had been practically blind for two years. After removal of the injured eye, the sympathizing eye had recovered its full vision in 2 hours. This condition is so absolutely different from the class of cases which Mackenzie had described, that there should be no question as to their differentiation. Yet there are certain symptoms of both, as well as the clear dependence of the disability of the sympathizing eye upon the lesions of the exciting eye, that tend to produce confusion. Both are marked by photophobia, lacrimation, ocular hyperemia, diminished power of accommodation and lowered visual acuity. On the other hand, absence of any exudates in the tissues of an eye with sympathetic irritation may be difficult to determine, because of its extreme irritability and the sensitiveness to light.

There are other ocular diseases that it is difficult to discriminate from sympathetic inflammation. Many uveal in-

flammations are bilateral; and the attack in the second eye may follow that in the first eye, at an interval and under circumstances quite suggestive of sympathetic inflammation. The tendency of focal infections in other parts of the body to give rise to relapsing uveitis, makes it difficult to exclude them from a possible share in producing the chronic, often malignant course of sympathetic ophthalmia. The similarity of allergic phenomena to some of the aspects of sympathetic ophthalmia, that gives support to the anaphylactic theory of sympathetic ophthalmia, is quite striking.

Bearing in mind the relatively short time that anything has been known about this condition, it is important to keep an open mind with regard to it and to carefully consider the suggestions of any well reported case, like those given on p. 574, and p. 584 in the hope of being helped to a better understanding of much that still seems obscure and uncertain. At the same time we must endeavor to eliminate some of the errors that are due to the mistaken classification of extraneous cases with those properly belonging to this pathologic condition. The occurrence of true sympathetic ophthalmia without traumatic rupture or perforation of the coats of an eye, and the method of its production, are still uncertain.

An error that should also be eliminated from the impressions that guide us in practice is; that retention of a foreign body in the eyeball is a source of special danger to the fellow eye, thru sympathetic ophthalmia. There are various ways in which a foreign body in an eyeball is an undesirable acquisition; and it is no advantage to retain it, if it can be removed without greater danger and harm. The risks of siderosis from iron, or chalcosis (from the Greek Chalco, brass) from copper, or other undesirable chemical effects from of further mechanical injury from contusion or movements of the eyeball are undesirable; and all to be considered in particles of unknown composition; or connection with each case of injury. A possible danger of sympathetic ophthalmia is a good "talking point" to urge on the patient for the removal of a blind eye. But, there is no evidence that mere presence of a foreign body in the eyeball increases the liability to this disease.

The injuries that are likely to cause sympathetic ophthalmia are often attended with lodgement of foreign bodies in the eye. It is not surprising that occasionally an eye that causes sympathetic ophthalmia contains a foreign body. But as a rule it does not. In the American Academy of Ophthalmology and Oto-Laryngology (1912) McReynolds called attention to this fact, that the presence of a foreign body has no importance in the production of sympathetic ophthalmia. Bulson at the last meeting of the Ophthalmic Section of the American Medical Association section emphasized the lack of foundation for such a fear.

H. Gifford, whose account of the subject in the American Encyclopedia of Ophthalmology gives the best resumé in the English languge, says: "The presence of an intraocular foreign body adds to the danger of a penetrating wound, only in so far as it increases the tendency for the traumatic inflammation to continue, or to relapse; or as it may act in favoring a subsequent endogenous infection" * * * * "On the other hand, it should be remembered that the removal of a foreign body by no means does away with the danger of sympathetic ophthalmia." The writer's experience agrees wholly with this. He does not recall among the cases of sympathetic ophthalmia he has seen any that happened to arise from an eye that still retained a foreign body. More frequently it follows a smooth cataract extraction.

One other point of practical importance is the prognosis for an eye in which sympathetic ophthalmia has recently appeared. This is not necessarily so bad as many believe and as neglected cases show. Gifford writes: "In 1910, the writer out of sixteen cases of sympathetic ophthalmia treated with enucleation, large doses of salicylates and mercurial inunctions, was able to report only two bad, one medium, one good and twelve very good results (6/9—6/6). More recently Morax in a series of thirty-nine cases

collected during the late war, found fourteen bad and twenty-five favorable results. He attributes this good showing to the very general use of neosalvarsan by the French surgeons. On the whole, it seems fair to say that 75 per cent of the cases, if seen within the first week, can retain useful sight if properly treated. In cases which have run a longer time without treatment, the danger of a bad result in spite of all treatment, is much greater."

The writer saw with Schneideman, a case that suffered three bad attacks of sympathetic ophthalmia, two relapses following alcoholic excesses to celebrate his first two recoveries of sight; yet, in the end, he retained very useful vision. My personal experience emphasizes the importance of mercury used internally, particularly calomel. The case reported by Key and those he cites in the paper referred to, seem to add removal of foci of infection to the important measures to combat this disease.

Altho the motto "safety first" urges that every prophylactic precaution should be taken, to avoid sympathetic ophthalmia, the value of prompt energetic treatment should not be obscured by any tendency to pessimism. It should always be present in our minds, to warn the patient of the need for immediate action in case this danger does arise, and to prompt the most effective, hopeful treatment, if the emergency is thrust upon us.

E. J.

OPHTHALMIC RESEARCH AND TEACHING.

At the Harvard University commencement in June, it was announced that provision for an ophthalmologic laboratory had been made by the subscriptions to a fund, now amounting to $500,000, the proceeds of which were to be devoted to this purpose. The first and largest contribution came from the family of Dr. Lucien Howe of Buffalo, as a memorial to three of its members who had served in the regular army of the United States, for an aggregate of 70 years.

The foundation will be known as the Howe Laboratory of Ophthalmology. It will be opened in the next few months, in what has been the Out-patient Department of the Massachusetts Eye and Ear Infirmary. Dr. Howe who was a student at Harvard in 1872 and 1873, will return to Boston as its first Director. His long record of devotion to ophthalmology, and especially to research in it and the teaching of it, make his selection for this honor and this opportunity peculiarly appropriate. It is to be hoped that his youthful enthusiasm will not overtax his bodily strength; as the boundless opportunities of the new situation open up before him.

Within this century, America will develop many centers of scientific research, and among them those devoted to medical sciences and the prevention of disease will be most important and most prominent. The financial and political conditions of the country are now peculiarly favorable to their organization and support. What is most needed today is the human element for such institutions, the young men and women, fitted by nature with good intellect, who have the desire to give their lives to original research and teaching.

The order of intellect that will secure success in this direction is much the same as will bring success in the active practice of any branch of medicine. The preeminent success in both directions cannot be attained in one life. In their claims on the time and energy of any individual active, private practice and systematic study will always be more or less opposed to each other. The opposing of one's will, energy and intelligence, against the desires, fixed notions and ignorance of patients, is always an exhausting, nerve-wracking process. He who has to keep it up in the struggle to overcome disease is in no condition to carry on the higher scientific research.

Such institutions as the Howe laboratory, the Wilmer Institute, and others that are coming into activity, offer to every young graduate in medicine, however poor he may be, the opportunity, if he has the fitness and the desire to live plainly, to give his life to the labors and the pleasures of scientific research and teaching. A Professor

of Ophthalmology, charged with the administration of a fund to help young men in this direction said: "It is the most difficult thing I have to do, to find young men who will take up this work." It can never yield the large financial returns of successful practice; but devotion to study, research and teaching can now secure freedom from financial worry, security in plain living, an honored standing in our profession and a broad intellectual development, that are among the solid satisfactions of life.

BOOK NOTICES.

Cancer de l'Appareil Visuel. V. Morax, Ophthalmologiste de l'Hôpital Lariboisiere. Paper, octavo, 506 pages, 139 illustrations in the text and 4 plates in colors. Paris, Gaston Doin and Co., 1926.

Cancer is a subject that has recently claimed much attention from specialists, surgeons, general practitioners, public health propagandists, and even the newspaper and the lay public. Its literature grows rapidly, theories of the nature of malignancy succeed each other and influence general pathology. It is one of the subjects on which every active member of the medical profession needs to keep posted; and because of the vastness of its literature, the oculist must get his information from writers who have sifted and condensed it. French speaking oculists, and thru them their colleagues thruout the world, are indebted to Morax for this added service he has performed for all of us.

This is the sixth volume of a library on cancer, published under the direction of Profs. Hartmann and Berard of Paris. It is a worthy successor to the work of Lagrange on Tumors of the Eye and Its Annexes, which has for over 20 years held an authoritative place in the world's literature of cancer. It is divided into eight chapters assigned to these topics: I Introduction and Definition; II Cancer of the Lids, 132 pages; III Cancer of the Conjunctiva and Cornea, 54 pages; IV Cancer of the Plica Semilunaris and Lacrimal Caruncle, 7 pages; V Cancer of the Lacrimal Apparatus, 20 pages; VI Intraocular Cancer, 150 pages; VII Orbital Cancer, 112 pages; VIII Cancer of the Intracranial Visual Apparatus, 10 pages.

The forms of cancer of peculiar interest to the oculist, intraocular cancer, have the longest chapter, divided thus: Tumors of the Iris, Sarcoma and Metastatic Epithelioma, 22 pages. Tumors of the Choroid, Sarcoma of the Choroid and Ciliary body and metastatic epithelioma of the Choroid, 65 pages. Tumors of the Retina, classed as retinocytoma and primary intraocular epithelioma, 10 pages. Retinocytoma is used in a general way to designate the socalled "glioma of the retina," in accordance with the suggestion of Mawas. But Morax points out that the term retinoblastoma is more appropriate for the tumors that show no differentiation and contain no stephanocytes (Mawas name for Flexner's rosettes); while the name retinocytoma belongs rather to those tumors containing rosettes, a minority of the primary tumors heretofore called "glioma of the retina."

The general character of this book is eminently practical; nothing is said of the various theories of the nature and causation of cancer. Since our anatomic definitions are still imperfect Morax bases his conception of cancer on the clinical feature of primary importance—the invasive character of cancer: "Parce que nos définitions anatomiques sont encore imparfaites, qu'il m'apparaît de toute nécessité de baser notre conception sur ceite donnée clinique de première importance: le caractère envahissant du cancer." The treatment of cancer is the direction in which every practitioner is seeking light and this aspect of the subject is not neglected. Operative treatment has first place, but radiotherapy receives equal consideration. The latter is described by Dr. Regaud who uses the term "radiotherapie" for the X-ray application and describes the use of radium under the name "Curietherapie," a term that is distinctive and appropriate, but which has not been generally used except by Madame Curie's countrymen.

The colored plates, reproductions of photographs and diagrams, have been used to present illustrative cases,

methods of operations and results of treatment. They are all truly illustrative, present the facts as they could be presented in no other way and are really good pictures. Each section of the book contains a bibliography of the literature referring to its subject, arranged by years. Thus in the first chapter are five such bibliographies. There is no alphabetic index; but the table of contents, over six pages, performs a similar function as a key for reference, altho in a slightly different way.

This is a book worth having. The pictures and diagrams tell their story in a universal language. Many of the words used in describing cancer, in French, resemble so closely their English equivalents, that their meaning is at once recognized. But if one wishes to learn to read French medical books, something very different from speaking or writing the language, here is a volume important, interesting, and written in such a clear, direct style that it forms an excellent beginning to attain that desirable accomplishment.

E. J.

Visual Field Studies. Ralph I. Lloyd, M.D., F.A.C.S., Surgeon, New York Ophthalmic Hospital, etc. Cloth, 222 pages, 125 illustrations. New York, The Technical Press, 1926.

This book shows some departures from ordinary bookmaking, and comes to the reader with a corresponding impression of freshness. On the cover is stamped a diagram of the first apparatus, used by Aubert and Forster in 1857, for study of the visual fields. It had a sheet of paper, stretched over two rollers, exposing an area two feet square; on which letters or figures, of equal size, were placed equal distances apart. In a room, so darkened that the fixation point was just seen, this field was rendered visible for an instant, by an electric flash. With such an apparatus began the study of visual acuity outside the region of the macula.

The text is not divided into chapters, but into an introduction and eight "parts." Part one is designated, History of Visual Field Examinations. As we have seen this history really begins on the front of the cover; and it runs to the end of part eight, where we find results reached by Holmes and Lister in studies made during and since the late war. The method of presenting its facts in their historic relations adds value thruout the book. Part two, 24 pages, is on Physiology of the Retina and Its Application to Field Examinations, but the relation of physiologic to pathologic conditions is another connecting thought that runs all thru this treatise.

Part three is headed Normal Fields. It takes up peripheral boundaries, blind spots, indications for field study, types of defects, methods and instruments; and ends with a picture of Evans metal cast, representing the visual apparatus from cornea to cortex, in its relations to the base of the skull. Part four is given to Chorioretinal Conditions, considered under 21 headings, in 77 pages. Part five, on Retrobulbar Disease, has 29 pages; and part six, Chiasm Disease, the same number. Part seven, Optic Tract Lesions, is given a single page; while part eight on Lesions Behind the Optic Thalmus, is given 17 pages. It would seem that the former might be considerably expanded, to bring it into better proportion to the other parts of the book.

The importance of field defects in the various toxic amblyopias causes them to figure quite largely in Part V. The Wernicke pupil test is well discussed in Part VI, except that the very simple method of Fisher for making the test, and the elaborate apparatus devised by Hess are not noticed. In Part VIII, the effects of lesions of the optic radiations and visual cortex are discussed, by the light of what has been learned of them thru injuries that occurred in the world war.

This is a suggestive book for the student; and, thru its adequate index and treatment of subjects from the historic point of view, will be useful as a work of reference. Its price, $6.00 net, illustrates the great rise in the costs of publishing, that has occurred in the last dozen years. It may also illustrate the fear of author and publisher that the demand for a work on this subject will be quite limited. This has been true

in the past; but there is coming to be a wider appreciation of the importance of studying the visual fields on the part of oculists, neurologists, brain surgeons, and general physicians. We hope that a second edition may be needed, and will receive wide attention.

E. J.

The Stereoscope in Ophthalmology. David W. Wells, M.D., F.A.C.S. Emeritus Professor of Ophthalmology, Boston University Medical School, etc. Third Edition. Cloth, 12mo., 108 pages, 34 illustrations. Boston, E. F. Mahady Co., 1926.

This little book continues to serve its purpose, of teaching the practical treatment of heterophoria and heterotropia, with the phorooptometer stereoscope and the author's selection of stereoscopic charts. The second edition was noticed in this journal (v. 1, p. 546). In most respects there is still the same need for definite directions, for concrete applications of methods of developing the fusion faculty and making it dominant.

The principal changes in this edition are the omission of the chapter on musculocapsular advancement, as rather outside of the general scope of this book. In its place we have an account of the measurement of stereopsis. For such measurements, Wells has modified and simplified the instrument suggested by Martin Cohen. He finds that the results obtained are comparable with those of the experiments of James and Howard in this field. We welcome this aid to more exact knowledge of the ocular movements.

E. J.

Augenkrankungen des Kindesalters in ihrer Besonderheit. Dr. L. Heine, Professor and Director of the University Eye Clinic in Kiel. Paper, Octavo, 56 pages, 9 illustrations. Berlin, S. Karger, 1925. Price 3 marks.

This monograph, on the special features of eye diseases in childhood, is published as a supplement to the Yearbook of Children's Diseases of A. Czerny.

It takes up in succession: Congenital anomalies, diseases of the lids, conjunctiva, cornea, tear passages, sclera, uveal tract and glaucoma; the diseases of the lens, retina, optic nerve, orbit, chiasm and optic tracts and visual paths and centers. Then come anomalies of refraction, accommodation and binocular vision; insufficiencies, comitant and paralytic strabismus, spasms of the eye muscles and nystagmus, pupil disturbances, scrofula, tuberculosis, syphilis (especially hereditary); injuries and educational eye diseases.

Everything is stated briefly. The first page gives, in form of a table, the development of the eyes during intrauterine life, arranged by months. Such a summary is extremely convenient for reference. On every page headings and heavy faced type direct the eye to the sentences that deal with the condition on which information is sought. This with the page giving a table of contents fairly makes up for the absence of any alphabetic index. The illustrations are reproductions of photographs of cases.

The treatise is one worth knowing about and having within reach, either to bring up this whole group of important ocular conditions, or to refer to for details regarding any one of them.

E. J.

Abstract Bulletin of Nela Research Laboratory. Edited by **W. E. Forsythe,** Director of the Laboratory. Vol. I, No. 4. Paper, 8vo., pages 523-746, illustrated. Cleveland. The General Electric Co.

This laboratory belongs to the incandescent lamp department of the General Electric Co. In it have been worked out numerous questions in physics and optics, some having important bearings on physiologic optics. The papers reporting results of such investigations have been published in full in various journals and transactions. In this volume are brought together the authors' abstracts of such papers, by 22 writers, on 40 different subjects. These abstracts briefly indicate the methods used and the results obtained. The majority of the papers have appeared in publications devoted

to physics and engineering, but 6 have appeared in the Journal of the Optical Society of America and 12 in various journals of psychology and physiology.

The subjects of most interest to students of physiologic optics and ophthalmology are given in Current Literature. Those on the effect of field illumination on foveal vision, the relative merits of monocular and binocular field glasses, aerial photometry and the visibility of airplanes, a theory of color vision and visibility curves for color defectives may be specially mentioned. The 57 illustrations are mostly charts and diagrams, with some reproductions of photographs including a portrait of the former Director of the laboratory, the late Dr. Ernest Fox Nichols, under whose administration the greater part of the work here recorded was done.

Any one studying problems in physiologic optics should have access to this collection of abstracts, and thru it to the original papers which the abstracts represent. Its value as a work of reference is rounded out by a table of contents and alphabetic index, and bibliographic references to literature bearing on many of the subjects considered. E. J.

Pacific Coast Oto-Ophthalmological Society, Transactions of the Thirteenth Annual Meeting. Vancouver, B. C. June, 1925. Paper, octavo, 136 pages, 6 plates. Published for the Society, W. F. Hoffman, Secretary. Seattle, Metropolitan Press.

Of this volume about one-third is given to papers relating to ophthalmology. These are ten in number, most of them accompanied with discussions they evoked. Some have been published in this journal. The titles of all of them are included in Current Literature.

These Transactions would make quite an imposing volume if printed in larger type and perhaps would be more easily read by the older members. But there is much to be said in favor of the economy of library space, which is certain to be demanded by the proceedings of a live society that year after year adds to the series of volumes it produces.

Among the papers of special interest that have not appeared in this journal are the report by S. S. Howe of Bellingham, of a case of "jaw winking;" one by A. C. Jones of Boise on acute ethmoiditis with rupture into the orbit; one by K. Pischel of San Francisco on localization of foreign bodies in the eye by markers in the conjunctiva; and one on "Eyesight, Education and Economics" by H. V. Würdemann of Seattle. E. J.

A Collection of Birds from the Fiji Islands. Casey A. Wood, M.D., M. B. O. U. and **Alexander Wetmore,** M. D., F. A. O. U. Paper, 12mo., 87 pages, Maps and 2 plates in colors. Reprint from the Ibis, Oct., 1925, Jan., 1926.

It is natural to trace Casey Wood into other fields of science by his writings. Now that he has become a Member of the British Ornithological Union, the Ophthalmologic Societies see him no more. This reprint consists of an introduction by Dr. Wood, 5 pages; an "Annotated List of Specimens Collected," by Dr. Wetmore, 36 pages; and "Field Observations," by Dr. Wood, 46 pages.

In Dr. Wetmore's notes the longest, three and one-half pages, is devoted to a new species, a small bird related to the sparrows, collected for Dr. Wood and according to the custom of naturalists named "Lalge Woodi." It is represented by one of the colored plates. To the lay reader, in which class the oculist who has never penetrated the forests of ornithology must be counted, the most interesting part of this brochure, is Dr. Wood's account of the interplay of bird and plant life in this detached region of the world, now beginning to feel the influence of increasing intercommunication.

E. J.

A Bipolar Theory of Living Processes. George W. Crile. Edited by **Amy Rowland.** Cloth, 8 vo., 422 pages, 62 illustrations. New York, The MacMillan Co., 1926.

This book does two things, it sets

forth a working hypothesis by which one may study the philosophy of vital processes; and it connects up a large amount of experimental work that has been done in this direction, especially by Dr. Crile and those who have worked with him. The first 221 pages set forth this theory in various aspects. The remainder of the volume is occupied by appendices, that summarize a large amount of observation, experiment and reasoning in support of the theory.

The function of a theory is to connect and correlate facts. When it harmonizes all the known facts bearing on the subject, it may be accepted as established. Yet, all theories must be held subject to revision or restatement, as additional facts are discovered. The way in which this theory associates many important phenomena is hinted in the chapter headings of Part II, entitled The Argument. Some of these hints are: The Unit Cell as a Bipolar Mechanism; Bipolar Interpretation of Protoplasm; Relation of Functions of Various Organs and Tissues in a Bipolar Mechanism; and Bipolar Interpretations of Poisoning and Disease.

The vast extent of the problem here dealt with is so well set forth in the opening paragraph of chapter 2, that we quote at length: "Any theory of the nature of life must account not only for the common fundamental phenomena of life in all forms of living beings, from the simplest to the most complex; but it also must identify the fundamental form of energy, to which the reactions of life can ultimately be traced. It must identify a uniform pattern or plan for the transformation and utilization of energy. It must account for the necessity for such ever present characteristics as the acid-alkali balance, the lipoid films, the omnipresent electrolytes. It must show why a continuous supply of oxygen and continuous oxidation are necessary. It must show the mechanism of stimulation and of specific response to stimulation. It must account for the phenomena of memory. It must account not only for reproduction but also for the transmission of acquired characteristics. It must identify the operation of the unicellular and of the multicellular organism, with the operation of protoplasm itself. It must show the mechanism of the creation of living matter—protoplasm—from the energy and matter of the environment.

It is obviously beyond the present scope of human knowledge to meet all these requirements. It is feasible, however, to present a theory which appears at least to point to a reasonable explanation of the essential characteristics of living organisms and of the phenomena of life itself."

It is a book highly corrective of the tendency to narrowness of thought and outlook, that besets the practical worker in a specialty, but withal to read its clear suggestive sentences may be found most refreshing.

E. J.

MARCUS FEINGOLD.

THOMAS HALL SHASTID.

SUPERIOR, WISCONSIN.

One of the greatest scholars, most highly skilled surgeons, and finest and gentlest characters in American Ophthalmology, passed to immortal rest and reward on December 26 last, in the person of Marcus Feingold.

Born in the little town of Botoshani, north Rumania, July 17, 1871, he was a son of Louis Kalonymus, and Antoinette Bechal, Feingold. His mother was a member of the well known Rothschild family, his father a wealthy Rumanian merchant. The father was descended from a long line of famous rabbins, and was himself a man of much culture.

Young Marcus received his preliminary schooling in an Austrian gymnasium. He then entered the medical department of the University of Vienna, from which institution he received the doctoral degree in 1896.

One year later he removed to New Orleans with his mother, sister and brother. The father had preceded them on a business trip, and had decided to make that city his home. There Dr. Feingold began at once the practice of general medicine, in 1897.

In 1898 he restricted his practice to the eye, ear, nose and throat ,and, some

years later, to the eye alone. In 1898 he founded a clinic in ophthalmology at Touro Infirmary. In 1906 he became professor of ophthalmology at the Tulane University, and was, for a number of years, head of the department. He was also chief ophthalmologist at Touro Infirmary; ophthalmologist at the Charity Hospital; chairman of the Medical Staff at Touro; member of the Executive Faculty at Tulane; chairman, A. M. A. Section on Ophthalmology, 1924-25; Fellow of the American College of Surgeons; member, Louisiana Governing Board of the Gorgas Memorial; examier of the American Board for Ophthalmic Examinations; collaborator on the American Journal of Ophthalmology.

The fine portrait of Dr. Feingold already published in this journal, p. 466, shows a characteristic pose and expression known to many of his friends, as he would pause an instant for thought before answering a question that had been put to him. He kept up his scholarly pursuits until almost the last moment of his life. He was very fond of languages, and spoke with ease not only his native Rumanian, but also English, German, French, Spanish and Italian. He had a very large, and yet choice, library, 2000 volumes of which were on the subject of ophthalmology alone. This great collection he bequeathed to the medical department of Tulane University.

At the early age of fifty-four, Dr. Feingold passed away. The end came after a prolonged and painful illness, borne with heroic fortitude, calm serenity and philosophic resignation. It is almost a sufficient commentary on the man to say that, even on his death bed, he examined and prescribed for several of his poorest patients.

Dr. Feingold had married, Mar. 23, 1904, Miss Bertha Loewenberg, of New Orleans, by whom he had a daughter, Rose Evelyn. The widow and daughter, as well as the brother, M. W. Feingold, of New York City, survive him.

Some of Dr. Feingold's more important articles are:

Progressive Macular Degeneration in Three Members of a Family. Archives of Ophthalmology, Vol. XIV, No. 6, 1916.

Congential Partial Defect of Retinal Pigment Layer of Iris in Both Eyes. Transactions of Twenty-first Annual Meeting, American Academy of Ophthalmology and Oto-laryngology, Dec. 11, 1916, pp. 151-156.

Fuchs' Coloboma with a Loop of Retinal Vein Hidden behind a Fold of Retina. Annals of Ophthalmology, Jan., 1917.

Granuloma of the Cornea. Transactions of the Twenty-second and Twenty-third Annual Meetings of the Am. Academy of Oph. and Oto-laryngology, Aug. 5-6, 1918, pp. 392-403.

Essential Atrophy of the Iris. Am. Journal of Ophthalmology, Jan., 1918.

Peripheral Communicating Vessels between Retina and Choroid. Trans. of Section on Ophthalmology of the A. M. A., 1920.

Mooren's Ulcer of the Cornea. Am. Journal of Oph. Mar. '21, V. III., No. 4.

An Unusual Epibulbar Carcinoma. Trans., Am. Ophthalmological Society, 58th Annual Meeting, Wash., D. C., 1922.

CORRESPONDENCE.

History of Cataract Discission.

To the Editor: Those interested in what took place at the Convention of English Speaking Ophthalmological Societies held in London, 1925, can now look thru the Proceedings for which they had to pay the additional Revenue Tax.

One of the chapters which interested me specially is the history of the discission of the lens. Altho it chooses to mention hardly anything since the rebirth of Ophthalmology in the middle of the 19th century up to now, which would give us an insight into the actions of the present generation, we are chiefly regaled with a resumé or recapitulation of what will be found elsewhere.

In the middle of page 156 the name Hirschberg is mentioned, but that is all. No sign that his monumental work of the History of Ophthalmology has even been looked thru even if

limited to the special question under consideration.

I wish to specify this point by calling the attention to what follows on this same page 156: "Banister was therefore, the first to recognize the disintegration and absorption of the cataractous lens." Under the bibliographic references we find (9) Banister, Richard—Treatise of 113 Diseases of the Eyes and Eyeliddes, London, 1622.

If the writer of the History of Discission of the Lens would have turned to the History of Hirschberg he would have found in the XIII Bd. of Graefe-Saemisch: Mittelalter und Neuzeit on page 330-332 Richard Banister described. The essential point is that he himself mentions in the foreword, that he (B) published the work of a valued writer in this (his) field; etc. Banister simply has copied Jacques Guillemeau. I will demonstrate this by quoting at length from Guillemeau's book: Trate des Maladies de l'oeil qui sont en nombre de cent treize ausquelles est sujet, Paris 1585, the passage referred to:

"Il se trouve aussi des Cataractes qui sont de telle nature que si tost q l'operateur les à attaintes de l'esguille pour les abatre, elles s'espanuissent, dilatent et espandent, n'estant assez fermes et solides pour soubstenir l'esguille, laquelle passe au travers d'icelles cõme ou travers d'un formage recentement fait et pour ce sont apelees proprement Cataractes laicteuses, pour la couleur et consistẽce quoelles ont a du laict, et quand telle chose advient et que le Chirurgien en rencontre de telles, il doit tacher à la dissoudre, remuant l'esguille de costé et d'autre: car se faisant i'ay veu et experimenté quelquefois, le plus cras et grossier de la dite Cataracte tõber et couler en bas, et le plus subtil se resoundre, et en fin le malade recouvrir la veüe."

I have hesitated to publish these facts, showing how history should not be written, as the writer of the history of discission cannot more defend himself, as "er aus dieser Zeitlichkeit abberufen worden ist," as lately was mentioned of a celebrated member of the fraternity.

But "amicus Plato, sed magis amica veritas."

E. E. Blaauw.

Buffalo, N. Y.

ABSTRACT DEPARTMENT

Reprints and journal articles to be abstracted should be sent to Dr. Lawrence T. Post, 520 Metropolitan Building, St. Louis, Mo. Only important papers will be used in this department, others of interest will be noticed in the Ophthalmic Year Book.

Georges, Gerard. Treatment of Facial Hemispasm by Alcohol Injections in Peripheral Branches of Facial Nerve. Ann. d'Ocul., 1926, April, pp. 277-294.

After a most detailed description of the anatomy of the facial nerve, four points of election for alcohol injections in the peripheral branches of the nerve, are described minutely by the author with an accompanying diagram. About 2 c.c. of alcohol, heated to 80 degrees, is injected at each point. The injection is superficial. There is some pain but not enough to necessitate preliminary anesthesia. Moderate reaction follows the injection. Relief from symptoms varies from one to three years. The author has been using this method for ten years and regards it as by far the best treatment for the malady.

L. T. P.

Viguier, Trachoma in the Military Marine. Gaz. des Hôp., 1926, v. 99, p. 529.

The author states that the army tolerates the quiescent and cicatricial forms, whereas the marine removes all granulations, whatever the stage of the disease. He spoke of the dangers of contagion in the different forms of trachoma, and of its exacerbation during service, and of the consequences of this from the viewpoint of the pension. He does not believe that the army should neglect the quiescent forms, as they may be contagious and might become exacerbated. The cica-

tricial forms might be permitted, on the other hand, in the marines on land service.

Lejonne thought it was difficult to say when a case was quiescent.

Lacat thought the cicatricial forms might be allowed in soldiers in garrison in the northern part of France.

Aubaret said that trachomatous patients often become excellent soldiers. He had seen trachoma improve during military service under treatment, and thought the milder forms might be admitted. C. L.

Lacat. The Different Treatments of Trachoma. Gaz. des Hôp., 1926, v. 99, p. 529.

The author reviewed the various methods of treatment and said that he believed that only brossage or ignipuncture gave satisfactory results. The virus was located in the submucosa of the upper fornix, and this must be attacked and destroyed.

To the local must be added the general treatment. Hygiene, in its widest sense, could cure the granulations with no other form of treatment. Tonics should be given to the weak, and those living at the seashore should take sea baths when not contraindicated.

Aubaret thought that the grattage of Lacat was the proper treatment, as it replaced the follicles by scar tissue.

Cuenod thought that any method which destroyed the subconjunctival tissue was good. He trusted most to subconjunctival injections of small amounts of a weak cyanid of mercury solution, which was especially efficacious in pannus. C. L.

Varese. The Antitrachomatous Fight in the Italian Colony of Tunis. Gaz. des Hôp., 1926, v. 99, p. 530.

This disease is endemic in the Sicilian population of Tunis, and causes much concern to the authorities.

Prophylaxis. The basis of this is school inspection. Special classes are maintained for trachomatous war orphans.

The *medical fight* has its headquarters at the Italian Hospital. The schools have a room reserved for the care of diseased eyes. Only simple treatment is given here. The serious cases are sent to the dispensary. All suspected cases are removed from the army. C. L.

Junes. Six Ocular Years, and the Antitrachomatous Fight at the Dispensary of La Croix-Rouge de Sfax. Gaz. des Hôp., 1926, v. 99, p. 530.

Seven thousand patients are seen here annually, nine-tenths of whom are Arabs. Since 1919, 1,623 operations have been performed, of which 1,253 were on trachoma patients. Most of the cases of conjunctivitis are due to Weeks' bacillus, trachoma, or the gonococcus, in the order named. The author believes that trachoma will develop only on a soil prepared by some previous inflammation. The fight, therefore, should be waged primarily against the Weeks' bacillus and the gonococcus.

Cuenod did not agree that a prepared soil was necessary, and said the doctor was frequently astonished to find trachoma when the lid was turned for some other purpose, for example, to remove a foreign body.

Nicolle agreed with Cuenod, and thought Junes' findings could be explained by a superinfection of trachoma on a Weeks' bacillus infection.

Aubaret dwelt on the frequency of mixed infection of trachoma and the pneumococcus and phlyctenular disease. C. L.

Nicolle, Ch., and Lumbroso, U. Origin and Conception of Trachoma. Gaz. des Hôp., 1926, v. 99, p. 530.

Researches at the Institut Pasteur have shown that inoculation of trachoma upon the conjunctiva of the rabbit is followed by the appearance of granulations in nonselective locations.

The rabbit often has follicles, harder than those of human or monkey trachoma, in the internal and external parts of the conjunctiva, which appear spontaneously. These natural follicles were used to infect the monkey, causing a nontrachomatous eruption localized electively on the lower lids. Other animals have similar, natural granula-

tions. It becomes a question, then, if in man there are not trachomatous viruses of different activity, or even different forms of the virus.

The authors believe that there are various forms of trachoma virus, and that they come from the soil. One form is adapted to human conjunctiva where it has developed a special seriousness. For this form, the name of trachoma should be reserved. It has the property, when inoculated in susceptible animals, of producing lesions of the human type, with special evolutions and localization.

It is to be hoped, that with the progress of civilization, the removal of mankind from contact with the earth will cause the disappearance of trachoma. C. L.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply news from their respective sections: Dr. H. Alexander Brown, San Francisco; Dr. Wm. Thornwall Davis, Washington; Dr. Gaylord C. Hall, Louisville, Ky.; Dr. George F. Keiper, LaFayette, Indiana; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. George H. Kress, Los Angeles; Dr. Edward D. LeCompte, Salt Lake City; Dr. W. H. Lowell, Boston; Dr. G. Oram Ring, Philadelphia; Dr. Charles P. Small, Chicago; Dr. G. McD. VanPoole, Honolulu.

DEATHS.

Dr. Edmond Landolt, of Paris, died May 9, 1926, in his eightieth year.

Dr. Franklin E. Wallace of Pueblo, Colorado, aged fifty-eight, died May 23.

Dr. Arthur J. Hill of Canton, Ohio, aged fifty-four, died May 12 of pernicious anemia.

SOCIETIES.

Dr. John O. McReynolds, Dallas, Texas, has been elected forty-second president of the Dallas County Medical Society.

The annual meeting of the Montana Academy of Oto-Ophthalmology was held at Billings, July 14 and 15. Webster Fox of Philadelphia was the guest of honor.

Dr. Clifton M. Miller has been elected president of the Virginia Society of Oto-laryngology and Ophthalmology; Dr. Charles S. Dodd, vice president, and Dr. Fletcher D. Woodward, secretary-treasurer.

The Minnesota Academy of Ophthalmology and Oto-Laryngology elected Dr. John L. Shellman of St. Paul, president; Drs. Walter E. Camp, of Minneapolis, and Frank N. Knapp, of Duluth, vice presidents; and Dr. John H. Morse of Minneapolis, secretary-treasurer.

Dr. Carroll L. Smith, Spokane, was elected president of the Pacific Coast Oto-Ophthalmological Society; Drs. William J. Mellinger, Santa Barbara, and Frank A. Burton, San Diego, vice presidents, and Dr. Walter E. Hoffman, Seattle, secretary-treasurer.

Dr. William Zentmayer, of Philadelphia, Professor of Ophthalmology in the Graduate School of the University of Pennsylvania, was elected President of the American Ophthalmological Society at its recent session at Hot Springs, Virginia. Dr. Walter E. Lambert, of New York City was elected vice president, and Dr. Emory Hill, of Richmond, Va., was re-elected secretary-treasurer.

The thirty-first annual meeting of the American Academy of Ophthalmology and Otolaryngology will be held at the Antlers Hotel, Colorado Springs, the week of September 13. The examining boards will hold their examinations in Denver, beginning September 13, the actual program of the Academy not starting until Tuesday. The Section on Instruction will begin Thursday and continue over Saturday. The golf tournament will be on Monday. Arrangements for play can be made with Dr. Frank L. Dennis, Ferguson Building, Colorado Springs.

THE HOWE LABORATORY OF OPHTHALMOLOGY.

At the recent commencement of Harvard University it was announced that a laboratory, to be known by the above official name, had been provided by a fund of $500,000, to be devoted to its establishment and support. The first half of this fund had been contributed by Dr. Lucien Howe of Buffalo, and members of his family, in commemoration of Dr. Howe's father, father-in-law and brother, who had rendered long and distinguished service in the United States Army. The balance of the fund was contributed by the General Education Board, Rockefeller Foundation, and Harvard University.

The laboratory will be put in operation in a few months, in what has heretofore been the out-patient department of the Massachusetts Eye and Ear Infirmary. It will be devoted to research and graduate teaching. Probably the first year will be given to organization and work on a special department of physiologic optics. Dr. Lucien Howe will be the first director of the laboratory.

PERSONALS.

Dr. Julian E. Kurtz donated to the Berks County Medical Society of Pennsylvania 400 volumes, mostly on subjects relating to the eye, ear, nose and throat.

The University of Pennsylvania has conferred the Doctor of Science degree upon Dr. Edward Jackson, Denver; Dr. Walter R. Parker, Detroit, and Dr. Harris P. Mosher, Boston.

Dr. George de Schweinitz, of Philadelphia, gave an informal dinner in honor of Dr. Koeppe on Friday evening, May 14. Dr. de Schweinitz sailed for Europe on June 30.

Dr. and Mrs. Howard Forde Hansell, of Philadelphia, sailed for Italy early in May. They will spend some weeks in Vittel, France, and will return to America late in September.

Dr. and Mrs. G. Oram Ring left for Europe in July for a motor trip in the Tyrolean Alps, the Vosges and Jura Mountains, Belgium and Holland, and plan to sail for America from Antwerp, September 3.

Dr. Leonard Koeppe has recently completed two Slit Lamp courses at Wills Hospital, Philadelphia, which were attended by ophthalmic surgeons from Philadelphia and from distant points.

Mr. Alba B. Johnson, formerly president of the Baldwin Locomotive Works, of Philadelphia, who has long been an active trustee of Jefferson Medical College, Philadelphia, was recently elected president of the institution to succeed Mr. William Potter, former ambassador to Italy.

Dr. Charles R. Heed, of Philadelphia, has been appointed Assistant Professor of Ophthalmology in the Jefferson Medical College. Dr. Heed has been associated with Dr. William M. Sweet, who recently succeeded Dr. Howard Forde Hansell as Professor of Ophthalmology in the Jefferson Medical College.

Dr. William Campbell Posey, of Philadelphia, with Mrs. Posey and their children left for Europe early in June to spend the summer in Brittany. Dr. Posey's distinguished position in American Ophthalmology makes his recently announced retirement from professional work a matter of very general regret.

Dr. K. Ichikawa, Professor of Ophthalmology in the University of Kioto, Japan, with Dr. Sugasaua, also of Kioto, spent several weeks in visiting the larger medical centers and universities of the United States. They are now paying similar visits to some of the principal medical centers of Europe.

Dr. Edwin B. Miller, of Philadelphia, Associate Professor of Ophthalmology in the Graduate School of the University of Pennsylvania, was recently appointed Ophthalmic Surgeon to the North West General Hospital and Ophthalmic Surgeon to the Stetson Hospital. Dr. Miller's clinic at the latter institution is being thoroughly modernized through the generosity of Mr. Howell M. Cummings.

Dr. Thomas B. Holloway, Professor of Ophthalmology in the University of Pennsylvania, was recently honored by Lafayette College, his Alma Mater, in the conferring upon him of the honorary degree of Doctor of Science. Dr. Holloway delivered a series of lectures in Denver, Colorado, during July, upon the "Vascular Lesions of the Ocular Fundus," in connection with the summer course in ophthalmology under the auspices of the Colorado Ophthalmological Society.

Dr. Luther C. Peter, of Philadelphia, was a recent guest of the Brooklyn Ophthalmological Society. His address consisted of a comparison of the ophthalmic teaching in Philadelphia of an earlier day with the present. Gettysburg College, Dr. Peter's Alma Mater, conferred upon him the degree of Sc. D. on June 9. Dr. Peter left Philadelphia early in July, by way of the Canadian Rockies for Vancouver, sailing from there for Alaska and returning via California to Colorado Springs to attend the Academy meeting during the week of September 13.

Col. Harry V. Wurdemann, medical officers' reserve corps, was given a surprise party, June 12, by seventy-five officers of the military service and their wives in honor of his sixtieth birthday. Col. Wurdemann is president of the Reserve Officers' Association, Department of Washington, and has long been active in military affairs. Capt. John Sullivan presented the honor guest with a flag, with citation of his services to National Defense, on behalf of the Reserve Officers, after Mrs. Sullivan and Miss Gladys Wheeler had given a musical program. Cards were the diversion for those not dancing. The committee in charge of the affair consisted of Lieut.-Col. Frederick M. Jones, U. S. Army; Lieut.-Col. George R. Heap. Med. 412th F. S.; Lieut.-Col. Malcolm Douglas, O.R.C.; Capt. John Sullivan, Mil. Int. O.R.C.; and Capt. John J. Lawson, Q.M., O.R.C.

If our news item contributors were all as active as the reporter from Philadelphia, the personal news items would be a more distinctive feature than at present. It is to be hoped that the men reporting items from other cities will show greater activity in the future, and that societies in localities not having reporters will see that someone volunteers for this service.

MISCELLANEOUS.

The Permanent Blind Relief Fund for Soldiers, New York, was left $1,000 in the will of the late Isaac Brill.

The Manhattan Eye, Ear, Nose and Throat Hospital, New York, was left $25,000 under the will of Mrs. Alice D. Jackson.

The Supreme Court of Delaware holds that the loss of vision its workmen sustain through accident should be based on the vision of the eyes without correcting lenses.

A Slit Lamp course will be given by Dr. Meesman at the University Eye Clinic, Berlin, Oct. 25 to 30, 1926.

Current Literature

These are the titles of papers bearing on ophthalmology. They are given in English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically, usually by the author's name in *heavy-faced type.* The abbreviations means: (Ill.) illustrated; (Pl.) plates; (Col. Pl.) colored plates. Abst. shows it is an abstract of the original article. (Bibl.) means bibliography and (Dis.) discussion published with a paper.

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